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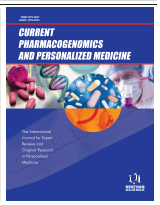
REVIEW ARTICLE

Alternative to Antibiotics from Herbal Origin – Outline of a Comprehensive Research Project



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Abstract: ***Background*:** The presently practiced procedure of development of new antimicrobial substances to control infection of the pathogenic microbes is now at a point of challenge and threat for losing relevancy in near future.

***Objective*:** Exploration of an herbal source for searching alternative to the antibacterial substances.

***Method*:** Through a thorough literature survey, a list of 1060 plants with reported use among various communities throughout the globe in the purposes related to combating and controlling different types of infection has been identified. An outline of research on the plants for validation of the traditional claims by conventional antimicrobial, antioxidant and immunostimulant activity study and identification of phytochemicals is added. Limitation of the contemporary systems is discussed with a proposal of addition of fresh extract of succulent plant parts of listed medicinal plants along with conventional solvent extracted portion of dry plant parts as another parameter of study.

***Result*:** A comprehensive research proposal for a study on the medicinal plants which may act in some way as an alternative to the present system of use of synthetic antimicrobial substances to control diseases of infective origin with a detailed guideline for production, storage and global transport of succulent bio-medicines is discussed.

***Conclusion*:** Following the way of proposed thorough research, a new type of herbal medicine based treatment system may be started and an opportunity for the establishment of export-oriented agro - medicine industries may be created.

Keywords: Antibiotics, alternative, herbal origin, succulant plant parts, antimicrobial, antioxidant, immunostimulant, agro-medicine industries.

1. INTRODUCTION

The living entities of our planet are struggling continuously for their existence. Starting from the minute viruses, the fungus, bacteria, protozoa, parasites, plants and animals of various differentiated species are struggling for their existence and multiplication. In the way of such struggle, as a part of evolution, many microorganisms developed their systems to secrete some antibacterial chemicals which are identified by some scientists and used as antibiotics [1]. Due to uncontrolled use of these chemicals, the susceptible organisms get ample opportunity to alter their old systems and to develop some new system to bypass the detrimental effect of those chemicals. It is called as microbial resistance to antibiotics [1].

Development of resistance among microorganisms against antimicrobial agents and spread of mainly plasmid based genetic materials related with such resistance to many other new species of microorganisms continuously with accelerated speed is becoming a threat for antimicrobial chemotherapy [2]. The spread is mainly due to indiscriminate, unnecessary use and residual effect of antibacterial substances [2]. Transport of such resistance power is performed by transport of genetic materials from one microorganism to another.

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Resistance in bacterial population spreads from person to person by bacteria, from bacterium to bacterium by plasmids, from plasmid to plasmid or chromosome by transposons [3]. The power of resistance is transmissible vertically among the same species and horizontally between other species of organisms [2]. That ultimately causes some very serious problems like development of Superbugs - organisms resistant to all available antibiotics [1]. This is perhaps becoming one of the most dangerous threats to the modern civilization in near future.

Not only antimicrobial resistance development, but some other microorganism related factors play some important roles in the establishment of disease among living entity. Among these, bacterial biofilm formation is most important. Biofilm can be considered as an association of micro-organisms on a living or non-living surfaces within a matrix of extracellular polymeric substance produced by them [4]. Many species of bacteria can communicate with one another through quorum sensing, a mechanism for coordination of gene expression during biofilm formation. Most of the microbial infections are associated with bacterial biofilms. Bacteria may remain less accessible to antibiotics and immune system of the body inside the biofilms and so that is having tremendous public health importance [4].

Molecular Pathological Epidemiology (MPE) is a multidisciplinary field of investigations of the interrelationship between exogenous and endogenous factors causing diseases [5]. Along with different diseases of neoplastic origin, that branch of science covers different non- neoplastic diseases like cardiovascular diseases, diabetes, obesity, adverse drug reactions, immunity-related as well as diseases of infectious origin for study [6]. At the individual patient level, each patient has unique pathologic processes resulting from cellular genomic, epigenomic, proteomic and metabolomic alterations, which are influenced by pharmacological, environmental, microbial, dietary and lifestyle factors [7].

MPE research has high relevance in disease prevention, because such studies have shown that different risk factors can influence different subtypes of one disease [8]. As per the theory, the transformation of population health science is integrated with social, behavioral, economic, environmental and ecologic sciences along with basic biology and medicine [6].

Plants are used as a therapeutic mean since ancient time. Among 2,50,000 higher plant species on earth, more than 80,000 are having medicinal value [9]. Leave, bark, seed, seed coat, flower, root, pulps *etc.* of different plants are considered as reservoirs of naturally occurring chemical compounds and of structurally diverse bioactive molecules. The industry directly can use these molecules or can use them as lead molecules to synthesize more potent molecules [10].

2. CONTEMPORARY SYSTEM OF VALIDATION OF EFFICACY OF MEDICINAL PLANTS AND TRIAL FOR DRUG DEVELOPMENT

Contemporary analytical systems for validation of traditional claims are generally performed with a target of identification of active principle/s from the reported medicinal plants.

Biological active compounds present in plants are called as phytochemicals. Phytoconstituent extraction involves the separation of the medicinally active principles from the plant using selective solvents [11]. Most of the pharmacological reports of plant/plant extracts screen the organic soluble extracts of the dried plant parts [12]. Research for identification of active principles from medicinal plants follows some common steps. Validation of the reported medicinal use of the plant is performed as a first and deciding step for further research [13]. Generally, the plant parts are collected, dried and preserved. Then methanolic, ethanolic, acetone, aqueous *etc.* extracts of the preserved plant parts were made and stored in different manners. Then these were tested for their reported medicinal use by different *in vitro* techniques and/or through *in vivo* animal models, either in that form or in semi-purified or purified form after identification of active principles [14].

Ethnomedicinal use of a plant was not confined to a single purpose in most of the times. As per the knowledge of modern medicine, only entry of some microorganisms inside a living body cannot produce a disease. Among many other factors, the effect of good immunity status and nutritional status of individuals can greatly influence that process. Oxidative stress is thought to contribute in the way of development of many diseases directly or indirectly [15, 16]. On the other hand, phytochemical extraction, purification, characterization and drug development also involve many complex steps. Some common analytical systems and procedures related with validation of traditional claims and development of plant derived drugs are stated briefly.

3. EXTRACTION OF PLANT MATERIALS FROM DRY PLANT PARTS BY DIFFERENT SOLVENTS

It is the first step of phyto-analytical study.

3.1. Solvents

Different solvents are used to extract the bioactive compounds from plant materials. For extraction of hydrophilic compounds, polar solvents such as methanol, ethanol, ethyl acetate *etc.* are used. For extraction of lipophilic compounds, dichloromethane or a mixture of dichloromethane and methanol in a ratio of 1:1 is also used. Hexane is used sometimes to remove chlorophyll [17].

3.2. Methods

Various methods like sonification, heating under reflux, soxhlet extraction and others are commonly recommended by Pharmacopeia of different countries. Other modern extraction techniques like solid-phase micro-extraction, supercritical-fluid extraction, pressurized-liquid extraction, microwave-assisted extraction, solid-phase extraction, surfactant-mediated techniques *etc.* are also used [18].

3.2.1. Validation of Traditional Claims by in vitro Study

The tests related to validation of effects are mostly performed on the solvent extracted materials of dry plant parts. In some specified requirements, the purified materials are also tested for their efficacy.

3.2.1.1. In vitro Antimicrobial Efficacy Study

For *in vitro* validation of traditional claims of the antimicrobial efficacy of any plant part, generally the direct antimicrobial efficacy is tested following some standardized methods, like:

i) Diffusion methods (Agar disk diffusion method, Antimicrobial gradient method, Agar well diffusion method, Agar plug diffusion method, Cross streak method *etc.*).

ii) Thin layer chromatography (TLC), Bio-autography (Agar diffusion, Direct bio-autography, Agar overlay bioassay *etc.*).

iii) Dilution methods (Broth dilution method, Agar dilution method)

iv) Time kill test by Time kill curve

v) ATP bioluminescence assay

vi) Flow cytofluorometric method [19] *etc.*

Recently, spectrophotometric evaluations of direct bacteriostatic action of plant-derived materials are tried [20]. In almost all these tests, direct antimicrobial efficacy (hampering of microbial multiplication or direct killing of micro organisms) is evaluated.

3.2.1.2. Anti-oxidant Property Study

By oxidation, free radicals are produced in the body which are detrimental to health. Antioxidants act against that process. Antioxidants are either produced inside the body system or achieved from food. Many fruits, vegetables and plant parts have such antioxidants.

The antioxidant activity is measured by some standardized methods like:

i) 2, 2-Diphenyl-1-picrylhydrazyl (DPPH) assay

ii) Folin-Ciocalteu method

iii) Xanthine oxidase inhibition assay

iv) Griess- Ilosvay method [21] *etc.*

3.2.1.3. Study for Immunostimulation Activity

Immunostimulants can stimulate the body protective mechanisms in different ways. The vaccines and introduction of any antigen inside the body can cause specific immunostimulation. The plant materials may act as a non-specific immunostimulant. Different methods are developed for the study of both cellular and humoral immunity.

i) Study of increase in haemagglutinating antibody (HA) titre for the study of humoral immunity,

ii) Counting of plaque forming cells (PFC) for the study of humoral immunity,

iii) Macrophage migration index (MMI) for the study of cellular immunity [22]

iv) Study of *in vitro* phagocytosis of *Candida albicans* spores by neutrophils taken from blood for phagocytosis power determination (cellular immunity) [23]

v) Assay of phagocytic activity of blood by the microscopical study (cellular immunity)

vi) Nitroblue tetrazolium chloride (NBT) Assay (cellular immunity)

vii) Serum lysozyme activity study (innate immune system) [24] *etc.*

3.2.2. Identification of Phytochemicals

The tests of this category are also performed generally on different solvent extracted materials of the dry plant parts. Different types of procedures are followed by scientists for this purpose. Some steps are stated below.

3.2.2.1. Purification

A number of chromatographic techniques such as HPLC (High Performance Liquid Chromatography), TLC (Thin Layer Chromatography), HPTLC (High Performance Thin Layer Chromatography), OPLC (Optimum Performance Laminar Chromatography), GC (Gas Chromatography), PC (Paper Chromatography), CC (Column Chromatography) [10] and non-chromatographic techniques such as immunoassay with use of monoclonal antibodies, phytochemical screening assay, Fourier-transform infrared spectroscopy (FTIR) [18] *etc.* are used for purification of the bioactive compounds.

Due to the fact that plant extracts usually occur as a combination of various types of bioactive compounds or phytochemicals with different polarities, their separation still remains a big challenge for the process of identification and characterization of bioactive compounds [18].

3.2.2.2. Structure Elucidation of the Purified/ Semi-purified Compounds

This step is performed by different standardized techniques like Fourier Transform Infra-Red spectroscopy (FTIR), Nuclear Magnetic Resonance (NMR), Mass Spectrometry (MS) *etc.* [10].

3.2.2.3. Biochemical Characterization of Purified/ Semi-purified Compounds

This is a multi-facet step which includes Toxicity assay, *In vivo* evaluation of efficacy and multistep Clinical Study [18].

i) Toxicity Study

For toxicity study of all types of chemicals, the most common practice is to follow the guidelines set by the Organisation for Economic Co-operation and Development (OECD). It has five sections (Physical and chemical properties, Effects on biotic systems, Degradation and accumulation, Health effects, other test guidelines) [25]. Many other toxicity study methods are also developed and followed according to the requirements.

ii) In vivo Study

Various tests are standardized with the tissue, blood and other body fluids of living entity for such type of study. In many cases, laboratory animals are also used. In *in vivo* study, the laboratory animals are designed for use in specific of purposes. The activity of some system or organ of the selected laboratory animals kept temporary or permanently suppressed or stimulated purposefully with the help of surgery, specific medication or by use of various devices. Mice, rat, guineapig and rabbit are the commonly used species for that purpose.

iii) Clinical Trial

The final step of drug development is the clinical trial. This step is rather complex and performed phase after phase. More or less the clinical trial of a drug has to pass a) Preclinical trial, b) Phase O trial, c) Phase 1 trial, d) Phase II trial, e) phase III trial and f) Phase IV trial [26].

4. LIMITATION OF THE CONTEMPORARY SYSTEM OF VALIDATION OF TRADITIONAL CLAIMS AND IDENTIFICATION OF PHYTOCHEMICALS FOR MEDICINAL USE

Quinine, Digitalis, Neostigmine, Codeine, Artemisinin *etc.* are some of the plant-derived active principles used effectively in Modern Medicine. Many phytochemicals are identified from various plants and valued only as some research data for their inability to pass the procedures to establish themselves as some effective medicines.

Many questions are raised against the conventional pattern of validation of traditional claims of a plant part with disease protective property/ies. It is said that only the solvent extracted part/s cannot represent the total effects of any medicinal plant.

It was found in an experiment that the semisolid methanolic extract of a plant part fail to produce any antimicrobial efficacy against microorganisms when diluted in water instead of methanol, though it was effective when diluted in methanol [20]. So, change of the diluents can affect the efficacy of the extracted plant materials in the laboratory.

It is argued that a plant medicine may act in such a way that can not be detected by the contemporary system, as the solvent extracted part or the separated active principles may not show the total effect of the plant part due to loss of many of the principles during the whole process [13]. On the other hand, one plant may act by using more than one body system together and so may perform a complex type of action inside the body as per the ethnomedicinal reports (Table **1**). Effects of use of plant parts, particularly when used internally directly as medicine, on a complex system like human body cannot be totally evaluated easily in artificial laboratory conditions and animal experimentation applying the presently available scientific knowledge and tools.

In almost all the ancient civilizations, plant parts were used as such. In many cases, the plant parts were used at its succulent stage, just after collection from the living plant. Generally, the ethnic and other rural people traditionally use the plants in its crude, succulent and fresh form in most of the time [13].

In Ayurveda system of medicine, the dry plant parts and their different formulations are generally used. Only the solvent extracted parts or active principles cannot show the total effect of such formulated medicines.

So, it may not be a wise decision of the scientific community to consider the contemporary system of validation and drug development as the only and ultimate way to get effective medicines from the plant source. A special type of technique may be developed where validation of traditional use of medicinal plant parts at its original reported usuable form on animal models may be performed at first. Then validation of reported dose and afterwards all other studies (toxicity study, identification of phytochemicals *etc*.) may be performed.

5. REPORTED ANTIMICROBIAL EFFICACY OF PLANT: REQUIREMENT OF THOROUGH RESEARCH

Inside human or any animal body, infection of any microorganism become established to cause a disease

after crossing many protective barriers. These barriers include nutritional status, lifestyle, living environment, age, body immunity status, prevalence of other immunosuppressive disease/conditions, genetic makeup *etc.* Perhaps due to this, in Homoeopathy system of therapy, patients are given more importance than disease symptoms. In Ayurveda system of medicine also, the balance of three types of 'body fluid' (rassa, pitta and Kafa) is considered the main parameter for establishment of a disease. Various internal factors are given importance in many other systems also.

Various components are developed in various species of plants as a part of the evolutionary outcome of the struggle for their existence [1]. Microorganisms are struggling against the attack of other groups of microorganisms and so developed such tools for their protection. These tools were identified and chemically synthesized by us to use as some weapons to kill pathogenic micro-organisms in the name of 'Antibiotics'. Like all other living entities of the globe, plants are also struggling for their existence and multiplication. To protect themselves from the infection of the soil and other environmental microorganisms, plants also developed some ways and means [1]. Those may differ from plant to plant, but it is expected. The mechanisms of action of such plant-derived antimicrobial substances are rather complex and different than those of antibiotics. It may be assumed that the system of living and development of fighting weapons against the infecting microbes are far more diverse and complex among plants in comparison to antibiotic-producing microorganisms. So, the action of many antimicrobial weapons together may be the actual basis for fighting against invading microbes in plants. All these weapons may not be available at detectable amount in dry plant part extracts. From this point of view, only evaluation of some solvent extracted portion and identification of active principles from plant parts to validate traditional claims and to achieve desired effects may not be considered as a sufficient or foolproof concept. As the living plants are actively engaged in many such operations continuously, the importance of the study of plant materials just after collection from living plants cannot be ignored.

There are some other important considerations also. Plants also develop many other types of phytoconstituents which can protect us indirectly from infection of pathogenic microbes. Different plant derived nutriceuticals are among them. This important point demands thorough study. As a part of modern lifestyle, the allopathic medicines, pesticide residues in the food items, the adulterants and added chemicals in the name of artificial color, flavor, stabilizing agent, emulsifying agent, chilling agent *etc.* as well as other toxic chemicals enter through different ways inside the body system of modern men are definitely acting together during causing any effect. The same detoxifying organs and excretory organs inside our body are struggling to clear them [27]. Effective use of plant derived medicines and nutriceuticals as well as changes in the lifestyle may influence molecular pathological epidemiology of populations and so can deeply influence the establishment of different diseases.

6. IDENTIFICATION OF PLANTS WITH REPORTED USE AS ANTIMICROBIAL AND OTHER RELATED PURPOSES

The traditional use of parts of some plants in medicinal purposes was practiced in almost all parts of our planet for thousands of years before the development of Modern Medicine. The knowledge was gathered perhaps through the cumulative experience of trial and error, instinct or insight or by such other practices of some specific category of people for generations. The documented knowledge of various sources are scrutinized thoroughly and a list of 1060 plants with possible antimicrobial efficacy has been prepared (Table **1**).

Some workers have enlisted the plants available and used in their localities or countries for the purposes like skin affections [28-30], wound healing and other related activities [31, 32]. In some other sources, many other important medicinal uses of plants are described along with such effects [33, 34]. In the present list, the reported native habitat or distribution of the plants are attached to get some idea about the best climate for cultivation of the plants. However, in most of the cases, the plants are naturalized in many other countries and adopted in many other related climates also. The list may be increased to some extent as preparation of an exhaustive list of plants used in such practices may require country wise involvement of researchers.

In the present article, the plants with related activities are listed for validation of the traditional claims with a target to get effective bio-medicines from them. Traditional uses of the plant parts are described in different manners by different authors. Moreover, the described purposes related with the use of any plant part/s are not always at per with the description style of the modern medicine. Some broad areas are covered by the used terminologies in most of the cases, instead of showing specific problem/s or disease. A variety of diseases may be covered with such terminologies (chest affections, urinary affections *etc.*). Some plants are reported for their efficacy to excrete accumulated toxins from the body (as *Paederia foetida* L.) or acting as a diuretic (*Tribulus alatus* Delile. *Terminalia catappa* L., *Veronica beccabunga* L. *etc.*). Such type of efficacy may also add some extra power to the body system to resist many types of diseases. Plants with a report of containing important nutrients, vitamins, minerals *etc.* without any report of medicinal use are excluded during screening, though those may play many important roles in maintaining overall immunity by influencing the protective power of the body against different diseases.

Table 1. Plants with reported antimicrobial and related effects.

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Abrus precatorius L.	Fabaceae	In cough and colds [34]; in cuts and wounds [35]	India
Abutilon indicum (Link) Sweet.	Malvaceae	Febrifuse, nerve tonic, piles [34]; plant antimicrobial [36]	Tropical and subtropical regions
Acacia erioloba E. Mey.	Fabaceae	Wood ash wound healing [37]	Southern Africa
Acacia leucophloea (Roxb.) Willd.	Fabaceae	Bark antimicrobial [36]	India.
Acacia mellifera Benth	Fabaceae	Root poultice in wound healing [37]	African countries
Acacia nilotica (L.) Willd. ex Del.	Fabaceae	Plant antimicrobial [36]	Africa, Middle east, Indian subcontinent
Acalypha indica L.	Euphorbiaceae	Cutaneous problems [34]; leaf in ulcer [33]	Africa, Indian subcontinent
Acalypha praemorsa Blatt. & Mccan.	Euphorbiaceae	Anti-Typhoid activity [34]	Africa, Arab, Indian Subcontinent
Acanthospermum hispidum (DC) A Chev.	Asteraceae	Oil antibacterial, antifungal [34]; whole plant in skin diseases [38]	Central and South America
Achillea biebersteinii Afan.	Asteraceae	Leaf and flower antimicrobial [39]	Russia to Arabian countries, Pakistan
Achillea membranacea (Labill.) DC.	Asteraceae	Leaf and flower antimicrobial [40]	Turkey, Iraq, Lebanon, Syria
Achillea millefolium L.	Asteraceae	Plant tonic, styptic, vulnerary [34]; flowerhead antimicrobial [41]	Temperate Northern Hemisphere
Achyranthes aspera L.	Amaranthaceae	Wound healing [42]; root ointment in boils, abscesses [43]	Tropical world
Acokanthera schimperi (A.DC.) Schweinf.	Apocynaceae	Leaf in Scabies, Leprosy, wounds [44]	Eastern and central Africa,Yemen
Aconithum heterophyllum Wall. Ex Royle	Ranunculaceae	Root as febrifuge, tonic, throat infection [34]	India, Himalayan regions
Acorus calamus L.	Acoraceae	Analgesic, abdominal tumor, dysentery [34]; rhizome antibacterial [33]	India, central Asia, Russia, eastern Europe
Acronychia pedunculata (L.) Miq.	Rutaceae	Bark tonic, root and bark in sores and ulcers [34]	South and southeast Asia
Acrostichum aureum L.	Pteridaceae	Rhizome applied on boils [34]	Tropical and sub-tropical areas
Actiniopteris australis Link.	Pteridaceae	Antiseptic and styptic [34]	Africa, Arab, India to Malaysia, Australia
Adansonia digitata L.	Malvaceae	Leaf wound healing [45]	African continent
Aegle marmelos (L.) Corrêa	Rutaceae	Plant antibacterial [33, 36]	India, Nepal, Myanmar
Aframomum melegueta K. Schum.	Zingiberaceae	Seed used in infectious diseases [46]	Western Africa
Agave americana L.	Asparagaceae	Leaf in Scarvy, Syphilis, veneral sores [34]	Mexico,United States
Agave cantala (Haw.) Roxb. ex Salm-Dyck.	Asparagaceae	Leaf in cuts, wounds and burns [47]	Southeastern Asia
Agelanthus dodoneifolius (DC) R.M. Polhil & D. Wiens.	Loranthaceae	Leaf in skin diseases [48]	Western African countries

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Ageratina adenophora (Spreng) King & H. Rob.	Asteraceae	Cuts and wounds [49]	Mexico and Central America
Ageratum houstonianum Mill.	Asteraceae	Leaf in cuts and wounds [28]	Central America, Mexico
Aglaia odorata Lour.	Meliaceae	Leaf stimulant, antipyretic; flower in eruptive fever and veneral diseases [34]	China to Myanmar
Agrimonia pilosa Lebeb	Rosaceae	Underground part antibacterial; plant used as tonic [34]; in wound healing [50]	Korea, Japan, China, Siberia, Eastern Europe
Albizia adianthifolia W. Wight	Fabaceae	Bark and root in eczema and skin complaints [51]	Western part of Africa
Albizia julibrissin (Duraz) Baker	Fabaceae	Seed in Leprosy [52]	Southwestern and eastern Asia
Alchornea cordifolia Müll.Arg.	Euphorbiaceae	Leaf antimicrobial [53]	Tropical Africa
Alectra parasitica A. Rich. *var chitrakutensis* M.A.Rau	Orobanchaceae	Rhizome in Leprosy and Tuberculosis [34]	Indian subcontinent
Alisma plantago-aquatica L.	Alismataceae	Tonic, diuretic, Hydrophobia, Lukaemia, sores, ulcers and wounds [34]	Northern and central Africa
Allium sativum L.	Amaryllidaceae	Bulb in respiratory infections, Tuberculosis, duodenal ulcer, skin problems [34]	Central Asia
Allium cepa L.	Amaryllidaceae	Bulb antimicrobial [54]	Worldwide as spice
Aloe arborescens Mill.	Asphodelaceae	Leaf in wounds, burns, skin ailments [55]	Southern Africa
Aloe ferox Mill.	Asphodelaceae	Leaf and root in bruises, burns, psoriasis, eczema, skin cancer [56]	Southern Africa
Aloe vera (L.) Burm.f	Asphodelaceae	Leaf in dermatitis, skin disorders [34]; wound healing effect [57]	Tropical countries
Alpina galanga (L.) Willd.	Zingiberaceae	Antitubercular [34]; tonic, respiratory and stomach problems, disinfectant [33]	India to Malaysia
Alpinia malaccensis (Burm.f.) Roscoe	Zingiberaceae	Rhizome used to treat sores [34]	Indonesia and Malaysia
Alstonia scholaris (L.) R.Br.	Apocynaceae	Latex to sores, ulcers and tumors [34]; in skin diseases [33]	India to Malesia, Australasia
Amaranthus spinosus L.	Amaranthaceae	Eruptive fever, shoots in eczema [34]	Tropical Americas
Ammannia baccifera L	Lythraceae	Anti-Typhoid, anti-tubercular, ringworm [34]	Tropical Asia, America and Africa
Amorphophallus campanulatus (Roxb.) Blume ex Decne.	Araceae	Dysentery and piles [34]; in Leprosy [52]	Africa, South and Southeast Asia
Ampelocissus latifolia (Roxb.) Planch.	Vitaceae	Leaf in dental problems, indolent ulcers and dysentery [34]	Indian subcontinent
Amygdalus persica L.	Rosaceae	Leaf in sores [58]	Northwest China
Anagallis arvensis L.	Primulaceae	Expectorant, stimulant, vulnerary, Leprosy, Hydrophobia [34]	Europe, Western Asia, North Africa
Anamirta cocculus (L.) Wight & Arn.	Menispermaceae	Berry in ringworm and skin affections [34]	Southeast Asia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Anaphalis contorta (D.Don) Hook.f.	Compositae	Flower heads styptic, oil antibacterial [34]	Himalayan region
Anaphalis cinnamomea (DC.) C.B.Clarke	Asteraceae	Leaf to cuts and wounds [34]	Asian and North America
Anaphalis neelgerryana (DC.) DC.	Asteraceae	Fresh lef on wounds and cuts [34]	Southern part of India
Anaphalis triplinervis (Sims.) C.B.Clarke	Asteraceae	Flower paste in wound healing [59]	Himalayan region
Andrographis paniculata (Burm.f.) Nees.	Acanthaceae	Tonic, febrifuse, Cholera, Influenza, bronchitis, piles [34]	South and Southeastern Asia
Anisomeles indica (L.) Kunze.	Lamiaceae	Oil in uterine affection [34]; leaf wound healing [32]	Eastern Asia
Annona squamosa L.	Annonaceae	Leaf in cuts and wounds, animal wounds [61]	Tropical Americas and West Indies
Antirrhinum majus L.	Plantaginaceae	Leaf on tumors and ulcers [34]	Mediterranean region
Antirrhinum orontium L.	Plantaginaceae	Leaf on tumors and ulcers [34]	Europe
Apama siliquosa Lam.	Aristolochiaceae	Root in dysentery and Cholera, ointment in sores and ulcers [34]	Indian subcontinent
Apium graveolens L.	Apiaceae	Leaf stimulant, fruits intestinal antiseptic, Rheumatoid arthritis [34]	Cultivated as vegetable worldwide
Aporosa lindleyana (Wt.) Bail.	Phyllanthaceae	Leaf in burns [62]	Southern India, Sri Lanka
Arabidopsis thaliana (L.) Heynh.	Brassicaceae	Sores in the mouth [34]	Eurasia
Arctium lappa L.	Asteraceae	Root diuretic, in gout, skin affections, seed in psoriasis, acni, prurigo [34]	Eurasia
Arctostaphylos uva ursi (L.) Spreng.	Ericaceae	Leaf antimicrobial [63]	Circumpolar in northern latitudes
Ardisia solanacea Roxb.	Primulaceae	Root and bark in cuts and wounds [64]	Southeast Asia, west China
Argyreia nervosa (Burm.f.) Bojer.	Convolvulaceae	Gonorrhea, strangury, chronic ulcers, eczema, other skin troubles [34]	Indian subcontinent
Aristea ecklonii Baker.	Iridaceae	Painful rash, blisters [65]	Central and southern Africa
Aristolochia bracteolata Lam.	Aristolochaceae	Leaf in exzema [34]; foul ulcer [33]	Sub-Saharan Africa, Arab, India
Aristolochia indica L.	Aristolochiaceae	Root tonic, leaf in cough, principle increase phagocytosis [34]; root in rash [38]	India and Sri Lanka
Aristolochia macroura Gomes	Aristolochiaceae	Stem and leaf in Rheumatism, constituent of antiseptic preparation [34]	Widespread globally
Armoracia rusticana G.Gaertn. B.Mey. & Scherb.	Brassicaceae	Root antimicrobial [66]	Europe and western Asia
Arnebia euchroma (Royle) I.M.Johnst.	Boraginaceae	Tooth ache, ear ache, root paste on eruptions, showed anticancer activity [34]	West and Central Asia, Himalayan region
Arnica Montana L.	Asteraceae	Tonic, vulnerary, tincure in sprain and bruises [34]	Europe

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Artemisia absinthium L.	Asteraceae	Tonic, chronic fever, inflammation of liver [34]; leaf in swellings, wounds, dandruff [47]	Temperate regions of Eurasia, Africa
Artemisia afra Jacq. ex Willd.	Asteraceae	Leaf in acne and boils [67]	South Africa
Artemisia nilagirica (C.B.Clarke) Pamp.	Asteraceae	Leaf febrifuge, asthma; root tonic, antiseptic [34]; Leaf wound healing [32]	Tropical Asia
Artemisia roxburghiana Wall. ex Besser	Asteraceae	Leaf in cuts and wounds [68]	Slopes of Hymalaya
Artemisia sieversiana Ehrh. ex Willd.	Asteraceae	Plant antimicrobial [34]	Temperate Asia, Hymalayan regions
Arum hygrophilum Boiss.	Araceae	Leaf antimicrobial [40]	Arabian peninsula
Arum discoridis Sm.	Araceae	Leaf antimicrobial [40]	East of the Mediterranean sea
Aruncus dioicus (Walter) Fernald.	Rosaceae	Principle antibacterial [34]	Temperate areas
Asclepias curassavica L.	Apocynaceae	Root in piles, gonorrhoea, leaf juice in cancer, latex in warts and corns [34]	American tropics
Aspalathus linearis (Burm.f.) R.Dahlgren.	Fabaceae	Leaf in eczema [55]	South Africa
Asparagus gonoclados Baker.	Asparagaceae	Used in skin troubles [34]	Indian subcontinent
Asparagus racemosus Willd.	Asparagaceae	Leaf immunostimulant [60]; nerve tonic, antimicrobial [69]	Himalayan region, India, Sri Lanka
Aspilia africana C.D. Adams.	Compositae	Leaf antimicrobial [70]	Tropical Africa
Aspilia natalensis (Sond.) Wild.	Asteraceae	Leaf in wounds and sores [66]	Africa, Madagascar, Latin America
Asplenium trichomanes L.	Aspleniaceae	Expectorant, abscesses of uterus [34]	Worldwide in rocky areas
Aster amellus L.	Asteraceae	Root in cough, pulmonary affections, malarial fever, haemorrgage [34]	European mountains, western Asia
Aster bakeranus Burtt Davy ex C. A. Sm.	Asteraceae	Root in sores [66]	South Africa
Astragalus multiceps Wall.	Fabaceae	Seeds in colic and Leprosy [34]	Himalayan region
Athrixia phylicoides DC.	Asteraceae	Sores and boils [66]	Southern Africa
Azadirachta indica A. Juss.	Meliaceae	Plant antiseptic, in skin diseases [33]; disinfectant [60]	Indian subcontinent
Azanza lampas (Cav.) Alef.	Malvaceae	Root and fruit in Gonorrhea and Syphilis, floral parts in cutaneous diseases [34]	China, India to Malaysia
Bacopa monnieri (L.) Pennell.	Scrophulariaceae	Plant antimicrobial [36]	Worldwide
Bambusa bambos (L.) Voss.	Poaceae	Latex of heated branches in ear ache [32]	Southern Asia
Baptisia australis Hort. ex Lehm.	Fabaceae	Root in tooth ache [71]	North America
Barleria lupulina Lindl.	Acanthaceae	Leaf in wound healing [31, 72]	Southeast Asia
Barleria prionitis L.	Acanthaceae	Leaf in catarrhal affections, tooth ache, root febrifuge, boils, glandular swellings [34]	India, Sri Lanka, Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Barleria rigida Willd. ex Nees.	Acanthaceae	Root and leaf in wound healing [45]	Sothern Africa
Bauhinia acuminate L.	Fabaceae	Bark and leaf in Asthma, bladder stone and Leprosy [34]	Southeastern Asia
Bauhinia rufescens Lam.	Fabaceae	Diarrhoea and dysentery, bark and root in Leprosy, leaf in eye troubles [34]	African countries
Bauhinia petersiana Bolle.	Fabaceae	Leaf in wound healing [45]	African countries
Bauhinia vahlii Wright & Arn.	Fabaceae	Root in cuts, wounds [73]	Hymalayan regions
Bauhinia variegata L.	Caesalpiniaceae	Root to prevent obesity, bark in cutaneous trouble, ulcer, Leprosy [34]	South and Southeast Asia
Begonia cucullate Willd. var. *hookeri* (A.DC.) L.B.Sm. & B.G. Schub.	Begoniaceae	Leaf and flower antibacterial [34]	Tropical countries
Begonia heracleifolia Cham. & Schltdl.	Begoniaceae	Leaf and flower antibacterial [34]	Tropical and subtropical regions
Begonia palmata Don.	Begoniaceae	Extract of succulent stalk in veneral diseases [34]	Himalayan regions
Berberis aquifolium Purs.	Berberidaceae	Plant extract anti-psoriasis [74]	Western North america
Berberis aristata DC.	Berberidaceae	Stem in intermittent fever [34]; root and stem in ulcer and sore [33]	Temperate and sub-tropical regions
Berberis vulgaris L.	Berberidaceae	Infectious diseases, antiseptic, disinfectant [75] fruits in respiratory disorder, fever, cold, flu [76]	Worldwide
Bergenia ciliate (Haw.) Sternb. Revis.	Saxifragaceae	Rhizomes in diarrhoea, spleen enlargement, renal and pulmonary affections [34]	Hymalayan region
Bergia odorata Edgew.	Elatinaceae	Leaf in bone fracture and sores [34]	Western India to Arab and Africa
Beta vulgaris L.	Amaranthaceae	Leaf in burns, inflammations [52, 42]	Europe, north Africa to western Asia
Betula alnoides Buch-Ham.	Betulaceae	Bark in wound healing [50]	Hymalayan region
Betula utilis D.Don.	Betulaceae	Bark as antiseptic [34]	Hymalayan region
Bidens bipinnata L.	Asteraceae	Expectorant, eye and ear drop; root and seed in asthma [34]	Asia and North America
Bidens biternata (Lour.) Merr. & Sherff.	Asteraceae	Leaf in cuts and wounds [28]	Tropical Africa, India to Malaysia
Bidens pilosa L.	Asteraceae	Tonic, diuretic, febrifuge, skin troubles, fistula, Leprosy, leaf in eye and ear troubles [34]	America
Bidens tripartite L.	Asteraceae	Haematuria, chronic dysentery, eczema; seed as expectorant, diuretic, urinary stones [34]	Eurasia, North Africa, North America
Biophytum sensitivum (L.) DC.	Oxalidaceae	Tonic, tumors, leaf and root styptic, leaf in diabetes, asthma, Phthisis, seed on abscesses [34]	Southeast Asian countries
Blechnum orientale L.	Blechnaceae	Rhizome in urinary disorders and boils [34]	East and south east Asia, Australia
Blumea lacera (Burm.f.) DC.	Asteraceae	Wound healing [72]; febrifuge, diuretic [34]	Southeast Asia
Boerhavia diffusa L.	Nyctaginaceae	Root expectorant, diuretic, Asthma [34]; Gonorrhoea [33]; immunostimulant [60]	India, southern United States

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Bombax ceiba L.	Malvaceae	Bark tonic, styptic, fruit expectorant, diuretic, urinary calculi, ulceration [34]; antimicrobial [77]	India, southeastern Asia
Boophane disticha L.F.	Amaryllidaceae	Bulb in septic wounds, boils, external sores, rheumatism [56]	African countries
Borago officinalis L.	Boraginaceae	Urinary tract affections, skin diseases [34]	Mediterranean region
Boschniakia himalaica Hook f. & Thomson.	Orobanchaceae	Wound healing [50]	Hymalayan region
Boswellia serrata Triana & Planch.	Burseraceae	Bark in diarrhea, skin troubles, gum expectorant, diuretic, dysentery, pulmonary affections [34]	India and Pakistan
Botrychium lunaria (L.) Sw.	Ophioglossaceae	Dysentery, cuts, wounds, ruptures, root and frond in breast cancer [34]	Worldwide
Botrychium virginianum (L.) Sw	Ophioglossaceae	Dysentery, fresh root on cuts and bruises [34]	Hymalayan regions, parts of Europe, USA
Brassica nigra L.	Brassicaceae	Leaf and flower in Leprosy [78]	South Europe and south Asia
Breynia vitts–idaea (Burn.f.) C.E.C. Fisher.	Phyllanthaceae	Leaf on suppurative wounds, haemostatic, tonsil-litis, bark astringent, haemostatic [34]	India to Indonesia
Bridelia micrantha Baill.	Phyllanthaceae	Bark in burns and wounds [67]	African countries
Brucea javanica (L.) Merr.	Simaroubaceae	Fruit in malignant Malaria, diarrhoea, dysentery, leaf in skin troubles, seed oil in papilloma [34]	China, India to Malaysia, Australia
Brunfelsia uniflora (Pohl) D.Don.	Solanaceae	Roots in Rheumatism and Syphilis [34]	South America
Bryophyllum pinnatum (Lam.) Oken.	Crassulaceae	Leaf in wounds, bruises, boils, sloughing ulcers [34]	Madagascar
Buchanania cochinchinensis (Lour.) M. R. Almeida.	Anacardiaceae	Seed and leaf in skin diseases [79]	China, India to Malaysia
Buddleja globose Hope.	Buddlejaceae	Shout in stomach ulcers, leaf in dysentery [34]	Chile and Argentina
Buddleja madagascariensis Lam.	Buddlejaceae	Leaf in bronchitis, asthma and cough [34]	Madagascar
Bulbine frutescens (L) Willd.	Asphodelaceae	Leaf in wounds, burns, skin rash, itchiness, ringworm [80]	Southern Africa
Bulbine natalensis Rooiwortel.	Asphodelaceae	Leaf in wounds and burns [56]	Southern and southeastern Africa
Butea monosperma (Lam.) Taub.	Fabaceae	Seed in herpes [34]; in ringworm [33]	Southeast Asia
Buxus wallichiana Baill.	Buxaceae	Leaf in Rheumatism and Syphilis, bark as febrifuge [34]	Himalayan region
Byttneria herbacea Roxb.	Malvaceae	Root in cholera and diarrhoea [34]	Peninsular India
Calendula officinalis L.	Asteraceae	Diuretic, stimulant [34];wound healing [81]	Southern Europe
Callicarpa arborea Roxb.	Verbenaceae	Bark in cutaneous ailments [34]	China and Southeast Asia
Callicarpa tomentosa (L.) L.	Lamiaceae	Bark in skin troubles, hepatic obstructions, fever, leaf in aphthae of mouth [34]	India and Sri Lanka
Calophyllum inophyllum L.	Calophyllaceae	Seed oil in rheumatism, skin affections; bark in orchitis, indolent ulcers [34]	East Africa, India to Malesia, Australia
Calotropis gigantea (L.) W.T.Aiton.	Asclepiadaceae	Cuts and wounds, Leprosy [28, 52]	China, India to Malaysia, tropical Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Calotropis procera W.T. Aiton.	Apocynaceae	Root bark in Leprosy [34]; antimicrobial [36]	Tropical Africa, India, China
Calpurnia aurea (Ait.) Benth.	Fabaceae	Leaf in wound, Scabies [44]	African countries
Calycopteris floribunda (Roxb.) Lam.	Combretaceae	Leaf tonic, astringent, in ulcers [34]	Indian subcontinent
Campsis radicans Seem.	Bignoniaceae	Root for healing of wounds [34]	Eastern United States
Cannabis sativa L.	Cannabinaceae	Oil used in Leprosy [52]	Many countries throughout the globe
Canscora decussata (Roxb) Schult.	Gentianaceae	Juice in insanity, epilepsy, nervous debility [34]; Leprosy [52]	Burma, India
Canthium dicoccum (Gaertn) Merr.	Rubiaceae	Used in dandruff [38]; antimicrobial [82]	Southeast China to tropical Asia
Capparis sepiaria L.	Capparaceae	Tonic, febrifuge, skin problems [34]	India to Malaysia, China, tropical Africa
Capparis spinosa L.	Capparaceae	Bark diuretic, expectorant, tonic, liver affections, rheumatism, glandular Tuberculosis [34]	Parts of Asia, Africa, Australia, Europe
Capparis tomentosa Lam.	Capparaceae	Root in wounds, Leprosy [67]	African countries
Capparis zeylanica L.	Capparaceae	Root bark in Cholera [34];Immunostimulent,in wound healing [83]	Indian subcontinent, China
Capsella bursa-pastoris (L.) Medik.	Brassicaceae	Dysentery,diuretic, febrifuge, haemostatic; ailments of eye in Chinese medicine [34]	Eastern Europe, Asia minor
Capsicum annuum L.	Solanaceae	Fruit antimicrobial [84]	Part of Americas
Cardiospermum halicacabum L.	Sapindaceae	Leaf in body sores [67]	Tropical and subtropical Africa and Asia
Carpobrotus edulis (L.) N.E.Br.	Aizoeceae	Leaf in eczema, wounds, burns [56]	South Africa
Carthamus oxyacantha M.Bieb.	Asteraceae	Oil on ulcers and itches [34]	Eastern Mediterrian to India
Carthamus tinctorius L.	Asteraceae	Oil on sores and rheumatic swellings [34]	Worldwide
Caryophyllus aromaticus L.	Myrtaceae	Buds antimicrobial [41]	Indonesia
Cassia auriculata L.	Fabaceae	Bark astringent, seed in eye troubles, diabetes, chylous urine; root in skin troubles [34]	India and Sri Lanka
Cassine transvaalensis (Burtt Davy) Codd.	Celastraceae	Bark in skin rashes, infections, inflammation [45]	Southern Africa
Cassytha filiformis L.	Lauraceae	Bilious affections, urethritis, chronic dysentery, eye and skin infections [34]	Pantropical
Cayratia carnosa (Lam.) Gagnep.	Vitaceae	Root with pepper on boils; leaf on yoke sore of bullocks [34]	India to Malaysia, China, Australia
Cedrela toona Roxb. ex Rottle.	Meliaceae	Bark in chronic dysentery, ulcers [34]	Southern Asia, Australia
Cedrus deodara (Roxb.) G.Don.	Pinaceae	Oil in ulcer and skin diseases [34]	Himalayan region
Celosia argentea L.	Amaranthaceae	Seeds in diarrhoea, eye troubles, sore mouth [34]	Tropical origin
Celosia trigyna L.	Amaranthaceae	Leaf in boils and skin complaints [56]	Tropical Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Centella asiatica (L.) Urb.	Apiaceae	Leaf tonic and diuretic, used in Leprosy [34]; in wounds and acne [37]	Wetlands in Asia
Centranthera indica (L.) Gamble.	Orobanchaceae	Febrifuge, eye sore [34]	Hymalayan regions, Australia, Sri Lanka
Centratherum anthelminticum Kuntze.	Asteraceae	Seed stimulant, antiseptic [33]	Indian subcontinent
Ceriops tagal (Pers.) C.B.Rob.	Rhizophoraceae	Bark in malignant ulcers, haemorrhages [34]	Africa, China, India to Malaysia
Cetraria islandica (L.) Ach.	Parmeliaceae	Tonic, chronic catarrah, bronchitis [34]	Mountainous Northern Hemisphere
Champereia griffithii Planch. *ex* Kurz.	Opiliaceae	Leaf and root on ulcers [34]	China to Malaysia
Chenopodium album L.	Amaranthaceae	Leaf in skin diseases [42,47]; in wound healing [50]	Worldwide
Chenopodium ambrosioides Bert. ex Steud.	Amaranthaceae	Eczema [67]	Parts of Africa and America
Chenopodium schraderianum Schult.	Amaranthaceae	Leaf antimicrobial [39]	India, South Africa, Americas, Australia
Chironia baccifera L.	Gentianaceae	Leprosy, boils, acne, sores [67]	African countries
Chlorophytum borivilianum Santapau & R.R.Fern.	Asparagaceae	Root antimicrobial [36]	Indian peninsula
Chlorophytum laxum R.Br.	Asparagaceae	Tuber and leaf antimicrobial [36]	Africa, Asia, Australia
Chlorophytum tuberosum (Roxb.) Baker	Asparagaceae	Root antimicrobial [36]	Parts of Africa, India
Chloroxylon swietenia DC.	Rutaceae	Leaf in cuts, cattle wounds [85]	India, Sri Lanka, Madagascar
Chondrus crispus Stackh.	Gigartinaceae	Stimulant, cough, bronchitis, problems of blooder, kidney, skin [34]	Atlantic coast of Europe, North America
Chrysocoma ciliata L.	Asteraceae	In wounds [45]	Africa, Australia
Cichorium intybus L.	Asteraceae	Viral hepatitis in Unani medicine [60]	Eurppe, North America
Cinchona ledgeriana Moens ex Tremen.	Rubiaceae	Bark febrifuge, tonic [34]; antimicrobial [33]	India, Java,Colombia, Bolivia
Cinnamomum camphora (L.) J. Presl.	Lauraceae	Antiseptic, anti-inflammatory, stimulant [34]	China
Cinnamomum pauciflorum Nees.	Lauraceae	Bark cardiotonic, antiseptic [34]	China, Indian subcontinent
Cinnamomum verum J. Presl.	Lauraceae	Anti-microbial, anti-oxidant, wound healing, hepato-protective [86]	Sri Lanka
Cipadessa baccifera (Roth) Miq.	Meliaceae	Leaf in wounds [38]	India, Sri Lanka
Cirsium sinense C.B.Clarke	Compositae	Root in ulcers, abscesses [34]	China, Japan
Cirsium verutum (D.Don.) Spreng	Asteraceae	Leaf in wound healing [50]	Himalayasn region
Cissampelos capensis L.f.	Menispermaceae	Boils, sores, ulcers, Syphilis, snakebite wounds [55]	African countries

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Cissampelos pareira L.	Menispermaceae	Diuretic, dyspepsia, urinary troubles [34]; Leprosy [87]	India, China, some African countries
Cissus adnate Roxb.	Vitaceae	Tuber diuretic, in cuts, fractures [34]	Asia, Australia
Cissus quadrangularis L.	Vitaceae	Juice in scarvy, root in fracture [34]; shoot in wound healing [88]	Indian subcontinent
Citrullus colocynthis (L.) Schrad.	Cucurbitaceae	Root in jaundice, rheumatism, urinary troubles [34]; Leprosy [78]	Mediterranean Basin, Asia
Citrus paradise Macfad.	Rutaceae	Build up resistance [34]; seed antimicrobial [89]	Barbados
Cladonia alpestris (L.) Rabenh.	Cladoniaceae	Tuberculosis [34]	America, Europe
Clausena pentaphylla (Roxb.) DC.	Rutaceae	Bark in wounds and sprains of animals [34]	Sub-Himalayan India
Clematis gouriana Roxb. ex DC.	Ranunculaceae	Leaf in cuts, wounds, burns [90]	China, Indian subcontinent, Malaysia
Clematis triloba Heyne *ex* Roth	Ranunculaceae	Leprosy [34]	Part of Northern Hemisphere
Cleome chelidonii L. f.	Cleomaceae	Gingivitis, skin troubles [34]	India, Myanmar, Thailand, Indonesia
Cleome ramosissima Webb ex Parl.	Cleomaceae	Aerial parts antimicrobial [39]	Arabian countries
Cleome viscose L.	Cleomaceae	Leaf in cuts and wounds [91]	Tropics with good rainfall
Clerodendrum indicum (L.) Kuntze.	Lamiaceae	Root in asthma, cough, Tuberculosis like infections [34]	China, India to Malaysia
Clerodendrum phlomidis L.f.	Lamiaceae	Root in Gonorrhea [34]	India and Sri Lanka
Cnicus benedictus L.	Asteraceae	Wounds, ulcers [55]	Mediterranean region
Coccinia grandis (L.) Voigt	Cucurbitaceae	Leaf in curbancle, scabies, ulcer, abscess [32]	Africa to Asia
Cocculus hirsutus (L.) Diels.	Menispermaceae	Leaf in cuts, wounds, boils, Gonorrhoea, urinary troubles, eczema [92]; liver protection [93]	India, Pakistan, tropical Africa
Cocos nucifera L.	Arecaceae	Oil antimicrobial [94]	Tropical countries
Codonopsis ovata Benth.	Campanulaceae	Root and leaf in ulcers and wounds [34]	Western Himalayan region
Coelogyne cristata Lindl.	Orchidaceae	Pseudobulb in wound healing [95]	Eastern Himalayas and Vietnam
Coix lacryma-jobi L.	Poaceae	Affections of respiratory and urinary tract [34]	Southeast Asia
Colebrookea oppositifolia Sm.	Lamiaceae	Leaf on wound and bruices, root in epilepsy [34]	Hymalayan region
Coleus amboinicus Lour.	Lamiaceae	Leaf in chronic cough, asthma, urinary diseases [34]	Southern and Eastern Africa
Combretum kraussii Hochst	Combretaceae	Root in wound dressing [96]	African countries
Combretum molle R.Br. ex G.Don.	Combretaceae	Leaf in wound dressing [67]	African countries
Commelina benghalensis L.	Commelinaceae	Leprosy [34]; leaf in wounds [28]	Tropical Asia and Africa
Commelina nudiflora L.	Commelinacea	Leaf in sores, boils, itches and burns [34]	India, Bangladesh
Commicarpus grandiflorus (A.Rich.) Standl.	Nyctaginaceae	Plant antimicrobial [39]	Northan Africa, Arab

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Commicarpus plumbagineus (Cav.) Standl.	Nyctaginaceae	Leaf antimicrobial [39]	Tropical Africa to southern Spain
Commiphora mukul (Stocks) Hook.	Burseraceae	Diuretic, expectorant, uterine stimulant, rheumatism, antiseptic [34]	Northern Africa to central Asia, India
Commiphora myrrha (Nees) Eng.	Burseraceae	Resin antimicrobial [97]	Arabian peninsula
Connarus monocarpus L.	Connaraceae	Fruit in eye troubles, root oil on sweeling, bark in ulcers [34]	India and Sri Lanka
Conyza aegyptiaca (L.) Aiton.	Asteraceae	Leaf in skin diseases [98]	Tropical and warm temperate regions
Cordia dichotoma G.Forst.	Boraginaceae	Fruit in diseases of chest and urinary passage [34]	India to Malaysia,Australia
Cordia wallichii G. Don.	Boraginaceae	Fruit in bronchial affections [34]	Peninsular India
Coriandrum sativum L.	Apiaceae	Oil in wound healing [31]	Hot part of Europe, Africa and Asia
Cordyceps sinensis (Berk.) Sacc.	Ophiocordycipitaceae	Boost cellular immunity, asthma, Tuberculosis, bronchitis, kidney troubles [99]	Nepal, Tibet, Sikkim of India
Corydalis govaniana Wall.	Papaveraceae	Root tonic, diuretic, in syphilitic, scrofulous, cutaneous affections [34]	Hymalayan region
Coscinium fenestratum (Goetgh.) Colebr.	Menispermaceae	Febrifuge, dressing of wounds and ulcers [34]; stem and root antiseptic [33]	South and Southeast Asia
Costus speciosus (J. Konig) C.Specht.	Costaceae	Rhizome in skin diseases [33]	Southeast Asia
Cotyledon orbiculata L.	Crassulaceae	Leaf in corns, warts, boils [56]	Southern Africa
Crateva nurvala Buch.-Ham.	Capparaceae	Bark stimulate liver, in calculus and other urinary affections [34]; kidney stone [60]	China, India, southeast Asia
Crinum defixum Ker Gawl.	Amaryllidaceae	Bulb in burns, whitlow, carbuncles [34]	Indian peninsula
Crinum macowanii Baker.	Amaryllidaceae	Bulb and leaf in sores, boils and acne [37]	Africa
Croton bonplandianum Baill.	Euphorbiaceae	Leaf in wound healing [100], Haemostasis [145]	South America, Asia
Croton lechleri Müll.Arg.	Euphorbiaceae	Resin antimicrobial [101]	South America
Cryptolepis sanguinolenta (Lindl.) Schltr.	Asclepiadaceae	Root in hepatitis, urinary tract infections, stomach ache, tonic [102]	Some African countries
Cucumis melo L.	Cucurbitaceae	Seeds diuretic, pulp in chronic eczema [34]	Iran, Anatolia, Caucasus area
Cucumis myriocarpus E. Mey. ex Naud	Cucurbitaceae	Fruits in boils, abscesses [67]	Tropical and southern Africa
Cucurbita maxima Duch.	Cucurbitaceae	Seed as tonic, diuretic, fruit pulp on boils, burns, inflammations [34]	Worldwide
Cullen corylifolium (L.) Medik.	Fabaceae	Fruit diuretic, leucoderma, Leprosy, psoriasis, diseases of skin [34]; antibacterial [33]	China, India to Malaysia
Cuminum cyminum L.	Apiaceae	Spasmolytic, antimicrobial [69]	Iran and Mediterranean region
Curculigo orchioides Gaertn.	Hypoxidaceae	Tuberous root diuretic, tonic, in piles, diarrhoea, jaundice, asthma, skin troubles [34]	China, Japan, Indian Subcontinent
Curcuma longa L.	Zingiberaceae	Stimulant, tonic, in sprains, bruises [34]	South and southeast Asia
Curcuma amada Roxb.	Zingiberaceae	Rhizome wound healing [31]	South and southeast Asia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Cyathula prostrata (L.) Blume	Amaranthaceae	Root in dysentery, skin complaints [34]	Widespread in tropics
Cymbopogon flexuosus (Nees ex Steud.) W.Watson	Poaceae	Stomachic, anti microbial [69]	India, Sri Lanka, Burma, Thailand
Cymbopogon jwarancusa (Jones) Schult.	Poaceae	Cough, rheumatism, dyspepsia, gout, Cholera [34]	South east Asia
Cynodon dactylon (L.) Pers.	Poaceae	Leaf diuretic, rhizome in geniti-urinary troubles [34]; wound healing [72]	Warm climates worldwide
Cynometra ramiflora L.	Leguminosae	Seed oil in Leprosy and skin diseases [34]	India to Myanmar
Dactylorhiza hatagirea (D.Don) Soo.	Orchidaceae	Tuber in cuts and wounds [103]	Himalayan region
Dalbergia sympathetica Nimmo ex Grah.	Fabaceae	Bark paste on pimples [34]	Western Ghat, India
Daphne oleoides Schreber.	Thymelaeaceae	Bark and leaf in skin troubles [34]	Southern Europe, Africa, Asia Minor
Datura metel L.	Solanaceae	Seed and flower in Psoriasis [104]	Warmer parts of the world
Datura stramonium L.	Solanaceae	Leaf in boils, abscesses, wounds [56]	North America
Daucus carota L.	Apiaceae	Root diuretic, stimulant [34]; extract in Leprosy [52]	Temperate Europe, southwest Asia
Deeringia amaranthoides (Lam.) Merr.	Amaranthaceae	Leaf on sores [34]	China, India to Malaysia, Australia
Delphinium denudatum Wall.	Ranunculaceae	Root stimulant, tonic, in tooth ache [34]	Western Himalayas
Delphinium elatum L.	Ranunculaceae	Seed in skin diseases, flower in eye troubles [34]	Europe to north and central Asia
Dendrobium crumenatum Sw.	Orchidaceae	Leaf on boils, pimples, herb in nervous affections [34]	India to Malaysia
Dendrophthoe pentandra (L.) Miq.	Loranthaceae	Leaf on sores, ulcers [34]	China, India to Malaysia
Dentella repens(L.) J.R.Forst. & G.Forst.	Rubiaceae	Leaf in sores [34]	India to Malaysia
Desmodium velutinum (Willd.) DC.	Fabaceae	Leaf in skin diseases [28]	Madagascar, China, Indian to Malaysia
Dichrostachys cinerea (L.) Wight & Arn.	Fabaceae	Bark in abscesses and other skin affections [67]	Africa, Indian subcontinent, Australia
Dicoma anomala Sond.	Asteraceae	Wounds, ulcers, ringworm, head sores [67]	Southern Africa
Dicoma tomentosa Cass.	Asteraceae	Febrifuge, in putrescent wounds [34]	Africa, Indian subcontinent
Dictamnus albus L.	Rutaceae	Root bark in nervous diseases, plant in scabies, skin affections [34]	Warm Part of Europe, Africa, Asia
Digitalis purpurea L.	Plantaginaceae	Leaf in wound, burn [33]	Temperate Europe
Dillenia pentagyna Roxb.	Dilleniaceae	Bark in cuts and burns [105]	Southern Asia, Australia
Dioscorea alata L.	Dioscoreaceae	Tuber in Leprosy and piles [34]	Tropical Asia
Dioscorea bulbifera L.	Dioscoreaceae	Tuber in ulcers, piles, dysentery [34]	Africa, southern Asia
Dioscorea dregeana T.Durand & Schinz.	Dioscoreaceae	Tuber in cuts and sores [56]	South Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Diospyros malabarica (Desr.) Kostel.	Ebenaceae	Bark in dysentery, febrifuge; fruit as gargle in aphthae, sore throat [34]	Indian subcontinent, south east Asia
Diospyros melanoxylon Roxb.	Ebenaceae	Leaf diuretic, styptic, flowers in urinary and skin troubles [34]	India, Sri Lanka
Diospyros mespiliformis Hochst. ex A. DC.	Ebenaceae	Root, leaf in skin rash, bruises, wounds, ringworm [45]	Savannas of Africa
Diospyros paniculata Dalzell.	Ebenaceae	Fruits on burns [34]	Indian peninsula
Diospyros racemosa Roxb.	Ebenaceae	Gum from cut trees in tooth ache [34]	India, Sri Lanka
Diploclisia glaucescens (Bl.) Diels	Menispermaceae	Leaf in Syphilis, Gonorrhea [34]	Indo-Malesia, China
Dipteracanthus suffruticosus (Roxb.) Voigt.	Acanthaceae	Root in renal affections [34]	India
Dipterocarpus tuberculatus Roxb.	Dipterocarpaceae	Oleoresin on ulcers in Burma [34]	Bangladesh to Vietnam
Dipterocarpus turbinatus C.F.Gaertn.	Dipterocarpaceae	Oleoresin to ulcers, ringworm and other cutaneous diseases [34]	India and Southeast Asia
Dipterygium glaucum Decne.	Capparaceae	Leaf antimicrobial [39]	Egypt to Pakistan
Dodonaea angustifolia L.f.	Sapindaceae	Leaf and twig antipruritic, boils, skin diseases of the head and face [56]	Africa to Arabia, Australia, New Zealand.
Dodonaea viscose Jacq.	Sapindaceae	Leaf febrifuge, in burns and wounds [34]	Parts of Africa, America, Asia, Australia
Dolichandrone spathacea (L.f.) Seem.	Bignoniaceae	Seed antiseptic, in spasmodic affections [34]	Southern India, Sri Lanka
Dolichos trilobus L.	Fabaceae	Seed in rheumatism, root in ophthalmia, skin diseases [34]	Tropical Africa, Arabia to south Asia
Dregea volubilis (L. f.) Benth. ex Hook. f.	Apocynaceae	Leaf in boils and abscesses [34]	India
Drymaria cordata (L) Willd.	Caryophyllaceae	Juice febrifuge [34]; leaf in cuts, burns, wounds [28]	Africa, America, India
Drynaria quercifolia (L.) J. Sm.	Polypodiaceae	Rhizome antibacterial [34]	India to Malaysia, Australia
Dysoxylum malabaricum Bedd. ex Hiern.	Meliaceae	Wood oil in ear and eye diseases [34]	India
Ecbalium elaterium (L) A.Rich.	Cucurbitaceae	Fruit antimicrobial [40]	Europe, northern Africa, temperate Asia
Ecbolium viride (Forssk.) Alston.	Acanthaceae	Root in jaundice, rheumatism, leaf in stricture [34]; leaf and flower antimicrobial [39]	India, Srilanka, Bangladesh
Echinacea purpurea (L) Moench.	Asteraceae	Plant is antimicrobial [106]	North America, Canada
Echinacea angustifolia DC.	Asteraceae	Plant is antimicrobial [106]	North America, Canada
Echinacea pallida (Nutt.) Nutt.	Asteraceae	Plant is antimicrobial [106]	North America, Canada
Echium arabicum R. Mill.	Boraginaceae	Leaf antimicrobial [39]	Arabian countries
Eclipta prostrate (L.) L.	Asteraceae	Leaf tonic, hepatic and spleen enlargement, hair treatment, skin troubles, wound of animals [34]	Widespread

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Ekebergia capensis Sparrm.	Meliaceae	Bark in abscesses, boils and acne [107]	African countries
Elaeocarpus glandulosus Wall. ex Merr.	Elaeocarpaceae	Fruits in rheumatism, pneumonia, Leprosy, dropsy [34]	Suthern part of India
Elaeocarpus tuberculatus Roxb.	Elaeocarpaceae	Fruits in Typhoid, rheumatism, epilepsy [34]	India to Malaysia
Elephantopus scaber L.	Asteraceae	Root and leaf in diarrhoea, dysentery, root in tooth ache, leaf in eczema, ulcers [34]	Tropical Africa, part of Asia, Australia
Elephantorrhiza elephantina (Burch.) Skeels.	Fabaceae	Root and rhizome in acne, wounds, burns and other skin diseases [108]	Southern Africa
Elettaria cardamomum (L) Maton	Zingiberaceae	Seed antimicrobial [109]	Southern India
Elytraria acaulis (L. fil.) Lindau	Acanthaceae	Cough of infants, leaf in veneral diseases [34]	Africa and India
Embelia ruminata (E.Mey. ex A.Dc.) Mez.	Myrsinaceae	Tender leaf in open wounds, Leprosy [108]	African countries
Embelia ribes Burm.f.	Primulaceae	Fruits as tonic, anthelmintic, in chest and skin troubles [34]	Indian subcontinent
Embelia tsjeriam-cottam (Roem. & Schult.) A. DC	Primulaceae	Antibacterial and anti-tubercular [33]	India and Myanmar
Emblica officinalis Gaertn.	Phyllanthaceae	Antiseptic [69]; immunostimulant [60]; Antimicrobial [36]	India
Emilia sonchifolia (L.) DC. ex Wight	Asteraceae	Febrifuge, leaf in eye sores and night blindness [34]	Tropical world
Eminium spiculatum (Blume) Schott.	Araceae	Antimicrobial [40]	Lebanon and surrounding area
Enydra fluctuans Lour.	Asteraceae	Cutaneous and nervous affections [34]	Indian subcontinent, part of Africa
Entada rheedei Spreng.	Fabaceae	Stem in Scabies [38]	Tropics and subtropics
Enteromorpha intestinalis (Lin.) Nees	Ulvaceae	Tuberculosis [34]	Many part of the sea
Ephedra gerardiana Wallich ex C. A. Meyer	Ephedraceae	Asthma, berries in respiratory troubles [34]	Hymalayan regions
Equisetum arvense L.	Equisetaceae	Renal affections [34]	Arctic and temperate Northern Hemisphere
Equisetum debile Roxb. ex Vaucher	Equisetaceae	Gonorrhoea [34]	South east Asia
Erigeron Canadensis (L.) Cronquist	Asteraceae	Stimulant, haemostatic, in diarrhoea, dysentery, renal affections, ringworm, eczema [34]	North and central America
Eriolaena quinquelocularis (Wight & Arn.) Wight.	Malvaceae	Root in wounds [34]	India
Eriospermum abyssinicum Baker.	Eriospermaceae	Leaf in wounds, ulcers, abscesses, boils [45]	Africa
Erycibe paniculata Roxb.	Convolvulaceae	Bark in Cholera [34]	India, Himalayas, Andaman Islands
Erythrina lysistemon Hutch.	Fabaceae	Bark in sores, abscesses, open wounds [67]	South Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Erythrina stricta Roxb.	Fabaceae	Bark in rheumatism, asthma, itch, leprosy and epilepsy [34]	China, India to Vietnum
Erythrina variegata L.	Fabaceae	Leaf in burns, wounds [110]	Tropical and subtropical regions
Ethulia conyzoides L.f.	Asteraceae	Stomach troubles; leaf on wounds, sprains, fractures [34]	Asia, Africa
Eucalyptus camaldulensis Dehnh.	Myrtaceae	Oil in dysentery, diarrhoea, throat relax, dentistry [34]; bark in pimples [67]	Australia
Eucalyptus globules Labill.	Myrtaceae	Oil of leaf antiseptic, expectorant, febrifuge, respiratory diseases [34]	Australia
Euclea divinorum Hiern.	Ebenaceae	Root and leaf in skin rash, bleeding wounds [37]	Africa, Comoro islands, Arabia
Eugenia uniflora L.	Myrtaceae	Leaf in skin infections, other microbial infections [111]	East coast of South America
Eulophia campestris Wall.	Orchidaceae	Rhizome as tonic, aphrpdisiac, in heart troubles, stomatitis, purulent cough [34]	Indian subcontinent, Africa
Eulophia nuda Lindl.	Orchidaceae	Tubers in tumors, glandular Tuberculosis, bronchitis [34]	India to Malaysia
Eupatorium odoratum L.	Asteraceae	Leprosy, haemostatic, cuts, wounds [47, 78]	North America
Euphorbia antiquorum L.	Euphorbiaceae	Nervine troubles, dropsy,warts, cutaneous affections [34]	Mexico
Euphorbia barnhartii Croizat.	Euphorbiaceae	Leaf poultice on boils [33]	Central Africa
Euphorbia helioscopia L.	Euphorbiaceae	Seed in Cholera, juice in rheumatism, neuralgia, warts [34]	Many parts of Europe, Africa, Asia
Euphorbia hirta L.	Euphorbiaceae	Cough, asthma, dysentery, genito-urinary diseases, latex in warts [34]; antibacterial [33]	India
Euphorbia nivulia Buch.-Ham	Euphorbiaceae	Wounds of animal [33]	India to Myanmar
Euphorbia pilosa L.	Euphorbiaceae	Juice in fistular sores [34]; latex wound healing [50]	Central Asia, Himalayan region
Euphorbia thymifolia L.	Euphorbiaceae	Leaf stimulant; plant in ringworm [34]	Tropical and subtropical America
Euphorbia trigona Mill.	Euphorbiaceae	Leaf poultice on boils [34]	Central Africa
Excoecaria agallocha L.	Euphorbiaceae	Rheumatism, paralysis, Leprosy; leaf and latex on obstinate ulcers [34]	Bangladesh, India, Australia
Fagus sylvatica L.	Fagaceae	Yielded creosote analgesic and antiseptic [34]	Many part of Europe
Ferula jaeschkeana Vatke	Apiaceae	Latex in wounds and bruises [34]	Himalayan region
Ficus arnottiana (Miq.) Miq.	Moraceae	Leaf and bark in cutaneous affections [34]	India, Sri Lanka
Ficus benjamina L.	Moraceae	Leaf in oil on ulcers [34]	Asia and Australia
Ficus dalhousiae (Miq.) Miq.	Moraceae	Leaf, bark in liver and skin complaints [34]	Western Ghats, India
Ficus natalensis Hochst.	Moraceae	Leaf in Wounds, boils, warts and growths [67]	African countries
Ficus palmate Forssk.	Moraceae	Fruit in lungs and blooder diseases [34]	Nepal to Egypt via Arabian countries
Ficus racemosa L.	Moraceae	Cuts and wounds [112]	South and south east Asia, Australia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Ficus religiosa L.	Moraceae	Bark in ulcers and skin troubles [34]	Indian subcontinent, China
Ficus retusa L.	Moraceae	Adventitious root on painful tooth, root bark and leaf boiled in oil on wounds [34]	Malaysia
Ficus sur Forssk.	Moraceae	Bark in boils [67]	African countries
Ficus talbotii King.	Moraceae	Bark in ulcers, veneral diseases, diarrhoea, Leprosy [34]	India, Sri Lanka, China
Fleurya interrupta (L.) Gaudich.	Urticaceae	Root diuretic, leaf on carbuncles [34]	China, India to Malaysia
Floscopa scandens Lour.	Commelinaceae	Fractured bone; stem juice in eye sore [34]	India to Malaysia
Fluggea leucopyrus Willd.	Euphorbiaceae	Leaf on sores [38]	Widespread in Asia, Africa
Forsythia suspensa (Thunb.) Vahl.	Oleaceae	Fruit, bud antimicrobial [113]	Asia
Fritillaria cirrhosa D.Don	Liliaceae	Corns in asthma, bronchitis, tuberculosis [34]	China, Indian subcontinent, Myanmar
Fumaria officinalis L.	Papaveraceae	Leprosy, wound healing, antiseptic, disinfectant [114]	Western and Central Europe
Fumaria vaillantii Loisel.	Papaveraceae	Diuretic, in scrofulous skin affections [34]	Almost global distribution, in hilly areas
Galenia africana L.	Aizoaceae	Plant in wounds [56]	South-Western part of Africa
Galeopsis tetrahit L.	Lamiaceae	Infusion in pulmonary troubles [34]	Europe and northwestern Asia.
Galium verum L.	Rubiaceae	Urinary diseases, juice in epilepsy, cutaneous troubles [34]	Europe, north Africa, temperate Asia
Garcinia mangostana L.	Clusiaceae	Diarrhoea, dysentery, cutaneous affections [34]	Indonesia
Garcinia morella (Gaertn.) Desr.	Clusiaceae	Gum-resin in dropsical affections [34]; wound healing [60]	India, Sri Lanka, Philippines
Gardenia resinifera Roth.	Rubiaceae	Plant antiseptic, hepatoprotective, antirheumatic [69]	Tropical Africa, Asia, Pacific Islands
Gardenia turgida Roxb.	Rubiaceae	Fruits in affections of mammary gland [34]	India to Myanmar, China
Gaultheria fragrantissima Wall.	Ericaceae	Oil stimulant, rheumatism, neuralgia, antiseptic [34]	China, India to Malaysia
Gaultheria procumbens L.	Ericaceae	Oil is antirheumatic, antiseptic [34]	Northeastern North America
Gentiana kurroo Royle.	Gentianaceae	Tonic, febrifuge, urinary troubles [34]	Terrestrial
Geranium nepalense Sweet.	Geraniaceae	Renal diseases [34]	Asia
Geranium robertianum L.	Geraniaceae	Malaria like fever, urinary stone, jaundice, diarrhoea, haemorrhage [34]	Europe, Asia, North America, Africa
Geranium wallichianum Oliv.	Geraniaceae	Tooth ache and eye troubles [34]	Himalayan region
Glinus oppositifolius (L.) Aug. DC.	Molluginaceae	Antiseptic, juice in skin troubles [34]	Pantropical
Globba marantina L.	Zingiberaceae	Root tuber in Leucoderma [38]	South and southeast Asia
Gloriosa superba L.	Colchicaceae	Tuber tonic, to promote labour pain, in neuralgic pain, skin troubles [34]	Part of Africa, Asia
Glycosmis pentaphylla (Retz.) DC.	Rutaceae	Leaf in fever, liver complaints, eczema and other skin troubles [34]	Southeast Asia, northern Australia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Glycyrrhiza glabra L.	Fabaceae	Rhizomes and roots tonic, catarrhal affections, urinary problems [34]; antiseptic [33]	Southern Europe, parts of Asia
Glycyrrhiza uralensis Fisch. ex DC.	Fabaceae	Root antimicrobial [115]	Asia
Gmelina asiatica L.	Verbenaceae	Root in rheumatism, catarrah of the bladder; wood and stem in fevers [34]	South and southeast Asia
Gnidia kraussiana Meisn.	Thymelaeaceae	Root in burns, small pox,boils [56, 67]	African countries
Gomphostemma lucidum Wallich ex Bentham.	Lamiaceae	Root in pneumonia [34]	India, Laos, Myanmar toVi-etnam
Gouania tiliaefolia Lam.	Rhamnaceae	Pulp in skin complaints [34]	China, India to Malaysia
Graderia scabra Benth.	Orobanchaceae	Root on sores on the face [67]	African countries
Graptophyllum pictum (L.) Griff.	Acanthaceae	Cuts and skin complaints, leaf on swelling and ulcers [34]	Australasia - New Guinea
Grewia occidentalis L.	Malvaceae	Bark to dress wounds [56, 67]	Southern Africa
Grewia tenax Frosk.	Malvaceae	Wound healing [81]	Dry Africa, Arabia to India
Guettarda speciose L.	Rubiaceae	Bark in chronic dysentery, wounds and abscesses [34]	Eastern Africa, tropical Asia, Australia
Guiera senegalensis J.F. Gmel	Combretaceae	Stem bark and leaf in skin diseases [48]	Savanna zone of Africa
Gunnera perpensa L.	Gunneraceae	Root in dressing of wounds, psoriasis [67]	Eastern Africa
Gundelia tournefortii L.	Asteraceae	Leaf and root antimicrobial [40]	Eastern Mediterranean, Middle East
Gymnema acuminatum Wall.	Apocynaceae	Leaf on sores [34]	South east Asian countries
Gymnopetalum cochinchinense (Lour.) Kurz.	Cucurbitaceae	Leaf as anti tetanus after miscarriage, in ophthal-mia [34]	China, India to Malaysia
Gymnostachyum febrifugum Benth.	Acanthaceae	Root febrifuge, on blisters and sores on the tongue [34]	Western Ghats of India
Gynocardia odorata R.Br.	Achariaceae	Bark febrifuge, seeds in skin ailments [34]	Mountain valey forest of South Asia
Gynura aurantiaca (Blume) DC.	Asteraceae	Leaf in ringworm [34]	Southeast Asia
Gynura pseudochina (L.) DC	Asteraceae	Root in parturient women, leaf on pimples, herb in erysipelas, breast tumors [34]	China, India to Myanmar, tropi-cal Africa
Haemanthus coccineus L.	Amaryllidaceae	Leaf antiseptic for wounds and ulcers [45]	Southern Africa
Haemanthus multiflorus Martyn.	Amaryllidaceae	Plant on wounds and ulcers [34]	Sub-Saharan Africa to Arab
Haldinia cordifolia (Roxb.) Ridsdale.	Rubiaceae	Leaf on wounds and boils [116]	Southern Asia
Halleria lucida L.	Stilbaceae	Plant in skin complaints [67]	Southern Africa
Harpagophytum procumbens DC. ex Meisn.	Pedaliaceae	Root on sores, ulcers, boils [56]	Southern Africa
Harpephyllum caffrum Bernh. ex Krauss	Anacardiaceae	Bark in acne and eczema [55]	Southern Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Hedyotis auricularia L.	Rubiaceae	Diarrhoea, dysentery, colitis, cholera, leaf on wounds [34]	South east Asia, Australia
Hedyotis diffusa Willd.	Rubiaceae	Tonic, fever, Gonorrhoea; mouthwash in tooth ache [34]	China, Japan, Nepal
Hedyotis glabra R.Br. ex Wall.	Rubiaceae	With ginger and salt on incipient ulcers [34]	Tropical Asia, Pacific islands
Hedyotis umbellata (L.) Lam.	Rubiaceae	Leaf and root in asthma, bronchitis [34]	Peninsular India, Sri Lanka
Helichrysum foetidum Moench.	Asteraceae	Leaf on septic sores [56, 67]	Some African countries
Heliotropium curassavicum L.	Boraginaceae	Root on sores and wounds [34]	Much of the Americas
Heliotropium eichwaldii Steud.	Boraginaceae	Leaf on ulcers and warts [34]	Russia to India
Heliotropium indicum L.	Boraginaceae	Diuretic, ulcers, sores, wounds, gum boils, skin affections [34]	Asia
Heliotropium ovalifolium Forssk.	Boraginaceae	Syphilitic ulcers [34]	India to Myanmar, Africa, Australia
Heliotropium strigosum Willd.	Boraginaceae	Diuretic, sore eyes, boils, wounds and ulcers [34]	Tropical Africa, Arabia, Asia, Australia
Heliotropium tuberculosum (Boiss.) Boiss.	Boraginaceae	Gonorrhea, eye trouble of camels [34]	Africa
Helminthostachys zeylanica (L.) Hook.	Ophioglossaceae	Rhizomes in dysentery, whooping cough, catarrah, Phthisis [34]	China, India to Malaysia, Australia
Hemidesmus indicus (L.) R.Br.	Apocynaceae	Root in rheumatism, urinary diseases, skin problems [34]	South Asia
Hemionitis arifolia (Burm. f.) T. Moore	Pteridaceae	Frond juice on burns [34]	Tropical Asia
Herniaria glabra L.	Caryophyllaceae	Diuretic, catarrhal affections of the bladder [34]	North America and Europe
Herniaria hirsute L.	Caryophyllaceae	Diuretic, sore throat [34]	Eurasia, north Africa
Hesperethusa crenulata (Roxb.) M. Roem.	Rutaceae	Fruit in malignant and persistent fever [34]	China, south and southeast Asia
Heterophragma quadriloculare (Roxb.) K. Schum.	Bignoniaceae	Wood tar in cutaneous diseases [34]	Peninsular India
Heynea trijuga Roxb.	Meliaceae	Leaf decction in cholera [34]	China, India to Indonesia
Hibiscus mutabilis L.	Malvaceae	Leaf in cough, menorrhagia, dysuria, burn wounds, scalds [34]	China, Japan
Hibiscus surattensis L.	Malvaceae	Leaf and stalk in Inflammation, sores, skin irritation [34]	Africa and Asia
Hibiscus trionum L.	Malvaceae	Flowers diuretic, in skin troubles [34]	Tropical and subtropical regions
Hiptage benghalensis (L.) Kurz	Malpighiaceae	Vine in chronic rheumatism and asthma, leaf in cutaneous diseases [34]	India, southeast Asia, Philippins
Hoffmannseggia burchellii (DC.) Oliv.	Fabaceae	Root in wounds [45]	Southern Africa
Holarrhena antidysenterica (Linn.) Wall.	Apocynaceae	Bark in Amoebic dysentery, tonic, febrifuge, tuberculosis [33]	Tropical Asian countries

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Holoptelea integrifolia (Roxb.) Planch.	Ulmaceae	Bark and leaf antimicrobial [36]	East Asia
Hornstedtia costata (Roxb.) K.Schum.	Zingiberaceae	Seed in stomach ailments, debility, asthma, pulmonary affections [34]	Southeast Asia, Himalayan region
Houttuynia cordata Thunb.	Saururaceae	Leaf in Measles, dysentery, gonorrhoea, eye and skin troubles [34]	Japan, Korea, China, southeast Asia
Humboldtia vahliana Wight	Fabaceae	Bark in epilepsy, leprosy, ulcers [34]	Western ghats, India
Humulus lupulus L.	Cannabinaceae	Antiseptic [52]; hop substance anti bacterial [34]	Europe, western Asia, North America
Hunteria zeylanica (Retz.) Gardner ex Thwaites.	Apocynaceae	Leaf in wounds and cuts [34]	Parts of Africa, China, India to Malaysia
Hura crepitans L.	Euphorbiaceae	Latex, bark and seeds in leprosy [34]	Tropical Americas
Hybanthus enneaspermus (L.) F. Muell.	Violaceae	Tonic, root in urinary affections [34]	India, China, Africa, Australia
Hydnocarpus castanea Hook.f. & Thomson.	Achariaceae	Bark in cutaneous diseases [34]	Thailand, Malaysia, Indonesia
Hydnocarpus kurzii (King) Warb.	Achariaceae	Seed oil on leprosy [34]; antiseptic [33]	India to Myanmar
Hydnocarpus laurifolia (Den) Sleummer	Achariaceae	Seed oil in leprosy, tuberculosis, chronic skin infections, ophthalmia, wounds, ulcers [34]	South east Asia
Hydrastis Canadensis L.	Ranunculaceae	Root antimicrobial [117]	Southeastern Canada, eastern USA
Hydrocotyle javanica Thunb.	Apiaceae	Tonic, diuretic, dysentery, cutaneous diseases [34]	Tropical Asia
Hydrocotyle sibthorpioides Lam.	Araliaceae	Rheumatism, diuretic, pulmonary, cutaneous troubles, root in liver complaints, leaf on boils [34]	Southeastern Asia
Hydrolea zeylanica (L.) Vahl.	Hydroleaceae	Leaf antiseptic, applied on ulcers [34]	Pantropical
Hygrophila auriculata (Schumach.) Heine.	Acanthaceae	Jaundice, rheumatism, uro-genital diseases, seed in veneral diseases [33]	Tropical Asia, Africa
Hygrophila quadrivalvis (Buch.Ham.) Nees	Acanthaceae	Leaf in wounds and tooth ache [34]	South and south east Asia
Hypericum calycinum L.	Hypericaceae	Bacterial disease [118]	Mediterranean area
Hypericum hookerianum Wight & Arn.	Hypericaceae	Leaf and stem for wound healing [119]	Hymalayan region
Hypericum humifusum L.	Hypericaceae	Flower in olive oil or alcohol in old ulcers and eczema [34]	Western Europe
Hypericum perforatum L.	Hypericaceae	Expectorant, pulmonary, urinary troubles, flowers in olive oil on wounds, sores, ulcers, [34]	Parts of Europe and Asia
Hypericum sampsonii Hance.	Hypericaceae	For wound healing [34]	China, Japan, India
Hypochaeris glabra L.	Asteraceae	Root tonic, diuretic, fresh herb wound healing [34]	Europe, North Africa, Middle East
Hyptis brevipes Poit.	Lamiaceae	Decoction after parturition, leaf for healing of naval cord [34]	Pantropical
Hyptis capitata Jacq.	Lamiaceae	Tonic, root in amenorrhoea, leaf wound healing [34]	America, West Indies

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Hyptis suaveolens (L.) Poit.	Lamiaceae	Stimulant, lactagogue, catarrhal conditions, uterus affections [34]	Pantropical
Hyssopus officinalis L.	Lamiaceae	Stimulant, nervous disorders, pulmonary, urinary and uterine troubles, vulnerary [34]	Mediterranean regions
Ilex mitis (L.) Radlk.	Aquifoliaceae	Bark in skin rash, sores on the face [67]	Southern Africa
Impatiens chinensis L.	Balsaminaceae	Gonorrhoea, in burns [34]	India, Myanmar to Vietnam
Indigofera aspalathoides DC.	Fabaceae	Aerial parts in cutaneous affections, leprosy [34]	South India, Sri Lanka
Indigofera enneaphylla L.	Fabaceae	Juice diuretic, chronic veneral diseases [34]	Indoia to Malesia, Australia, Africa
Indigofera suffruticosa Mill.	Fabaceae	Febrifuge; in Syphilis, epilepsy, root and seed in urinary diseases and ulcers [34]	Subtropical and tropical Americas
Indigofera tinctoria L.	Fabaceae	Gnorrhoea, Urinary complaints, hepatitis, sores, old ulcers, piles [34]	Asia, parts of Africa
Inula racemosa Hook.f.	Asteraceae	General infectious diseases, antiseptic, disinfectant [75]	Himalayan region
Ipomoea crassipes Hook.	Convolvulaceae	Whole plant in sores [67]	Southern Africa
Ipomoea eriocarpa R. Br.	Convolvulaceae	Plant boiled in oil in rheumatism, epilepsy, Leprosy, ulcers [34]	Tropical Africa
Ipomoea obscura (L.) Ker Gawl.	Convolvulaceae	Toasted plant boiled in ghee in aphthous affections [34]	Parts of Africa, Asia, Pacific Islands
Ipomoea pes-tigridis L.	Convolvulaceae	Leaf on boils, sores, pimples, carbuncles [34]	Africa, southern and eastern Asia
Ipomoea purpurea (L.) Roth	Convolvulaceae	Used as anti-syphilitic [34]	New world tropics
Ipomoea quamoclit L.	Convolvulaceae	Leaf on haemorrhoids, carbuncles [34]	New World tropics
Ipomoea tuberculata Ker Gawl.	Convolvulaceae	Seed as antidote of hydrophobia [34]	Africa and Asia
Iris versicolor L.	Iridaceae	Root and rhizome antimicrobial [120]	North America, eastern Canada
Isatis tinctorial L.	Brassicaceae	Plant in ulcers [34]	Caucasus to Siberia and western Asia
Ixora chinensis Lam.	Rubiaceae	Flower in tuberculosis, haemorrhages, plant in urinary troubles, root fed after parturition [34]	Myanmar, Thailand, Vietnam, Malaysia
Ixora coccinea L.	Rubiaceae	Root astringent, antiseptic, diarrhoea, dysentery, sores, chronic ulcers, flower in dysentery, catarrhal bronchitis, eye troubles, as vulnerary [34]	Southern India, Sri Lanka
Jacaranda acutifolia Humb. & Bonpl.	Bignoniaceae	Bark and leaf in syphilis, gonorrhoea, leaf vulnerary, pectoral [34]	Part of South America
Jasminum fluminense Vell.	Oleaceae	Leaf and young shoot in ulcers and boils [45]	Some African countries
Jasminum grandiflorum L.	Oleaceae	Leaf antimicrobial [39]	South Asia, Arab, China
Jasminum humile L.	Oleaceae	Root dye in ringworm, bark juice in sinuses and fistulae [34]	Hymalayan regions
Jasminum multiflorum (Burm. f.) Andrew.	Oleaceae	Leaf in indolent ulcers [34]	India to Vietnam
Jateorhiza palmate (Lam.) Miers.	Menispermaceae	Root in sores [34]	East Africa.

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Jatropha curcas L.	Euphorbiaceae	Eczema and ringworm [34]; wounds and boils [67]	Tropical Americas
Jatropha gossypifolia L.	Euphorbiaceae	Leaf febrifuge, root in Leprosy; latex in ulcers [34]	Mexico, South America, India
Jatropha multifida L.	Euphorbiaceae	Leaf in scabies, seed in fever, veneral diseases [34]	Trinidad, Cuba, Southern USA, Mexico
Jatropha zeyheri Sond.	Euphorbiaceae	Rhizomes or juice in wounds, boils, sores, burns [56,67]	Some African countries
Juniperus communis L.	Cupressaceae	Fruits and essential oil stimulant, diuretic, diseases of uro-genital tract, skin [34]	Temperate Northern Hemi-sphere
Jussiaea repens L.	Onagraceae	Constituent of ointment for ulcers and skin prob-lems [34]	Asia, Australia, Africa
Jussiaea tenella Burm.f.	Onagraceae	Root in syphilis, plant in pimples [34]	Tropical Africa, tropical Amer-ica
Justicia tranquebariensis L.f.	Acanthaceae	Leaf juice to children in smallpox, contusions [34]	Peninsular India
Kaempferia galangal L.	Zingiberaceae	Rhizomes stimulant, expectorant, diuretic, in cough and pectoral affections [34]	China, India to Myanmar
Kaempferia rotunda L.	Zingiberaceae	Rhizome to remove clots and pus, tuber in tumors and wounds [34]	China, Indian subcontinent
Kalanchoe laciniata (L.) DC.	Crassulaceae	Leaf styptic, antiseptic, darrhoea, dysentery, lithiasis, Phthisis [34]	Africa, through Arab to east Asia
Kalanchoe petitiana A. Rich.	Crassulaceae	Leaf in eye diseases [121]	Madagascar and tropical Africa
Kigelia africana (Lam.) Benth.	Bignoniaceae	Fruit in syphilitic sores, bark in rheumatism, dysentery, veneral diseases [34]	Tropical Africa
Krameria triandra Ruiz & Pav.	Krameriaceae	Astringent, tonic, diarrhea, haemorrhage, menstrual and urinary complaints, sore throat [34]	South America
Lagerstroemia indica (L.) Pers.	Lythraceae	Bark stimulant, febrifuge, fruit in aphthae of mouth [34]	China, Korea, Japan, Indian subcontinent
Lannea edulis Engl.	Anacardiaceae	Bark in boils and abscesses [56, 67]	Some African countries
Lantana aculeata L.	Verbenaceae	Plant vulnerary, in fistula, pustules, tumors, Tetanus [34]	Central and South America
Lantana rugosa Thunb.	Verbenaceae	Leaf, stem and ripe fruits in festering sores, cuts [67]	Some African countries
Larrea tridentate (DC.) Co-ville	Zygophyllaceae	Leaf in skin infections [122]	Mexico, parts of USA
Lavandula angustifolia Mill.	Lamiaceae	Flower essential oil is antimicrobial [123]	Mediterranean regions
Lavandula pubescens Decne.	Lamiaceae	Essential oil is antimicrobial [124]	Arabian peninsula
Lawsonia inermis L.	Lythraceae	Leaf in boil, burn, skin diseases, sore throat [33]	Parts of Africa, Australasia
Leea aequata L.	Vitaceae	Anti tubercular activity [34]	India to Malaysia
Leea macrophylla Roxb. ex Hornem	Vitaceae	Tubers in wounds, sores and ringworm [34]	South and south east Asia
Lemna minor L.	Lemnaceae	Plant in cutaneous disorders [125]	Worldwide
Leonotis leonurus (L.) R.Br.	Lamiaceae	Leaves and stems in boils, eczema, itching and other skin diseases [34]	Southern Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Leonotis nepetifolia (L.) R.Br.	Lamiaceae	Plant in skin affections, flower ash on burns and scalds, leaf in rheumatism [34]	Tropical Africa, southern India
Leontonyx angustifolius DC.	Asteraceae	Plant in ulcers [56]	Some African countries
Leonurus sibiricus L.	Lamiaceae	Tonic, vulnerary, mensteual disorders, leaf and root febrifuge [34]	China, Japan, Korea, Siberia
Lepidium iberis L.	Brassicaceae	Seed in brochitis [34]	Hymalayan region, southern Europe
Lepidium latifolium L.	Brassicaceae	Hepatic and renal troubles, skin affections [34]	Europe, north Africa,west Asia
Lepidium sativum L.	Brassicaceae	Leaf diuretic, hepatic complaints, seed diuretic, tonic, in sprains, roots in Syphilis [34]	England, France, Netherlands, Scandinavia
Leptadenia reticulata (Retz.) Wight	Asclepiadaceae	Stimulant, leaf and root in skin affections, habitual abortion [34]	India to Malaysia
Leucas aspera (Willd.) Link.	Lamiaceae	Antipyritic, psoriasis, chronic skin eruptions, flowers in coughs and colds [34]	India and the Philippines
Leucas lavandulaefolia Willd.	Lamiaceae	Fresh leaf to old sores and dermatosis [34]	Indian suncontinent
Leucas zeylanica (L) R. Br.	Lamiaceae	Antipyretic, in skin troubles, decoction in ulcer of nose [34]	Tropical Asia and Malaysia
Licuala spinose Roxb.	Arecaceae	Bark in treatment of tuberculosis [34]	China to Malaysia
Lilium candidum L.	Liliaceae	Bulb in tumors, ulcers and skin inflammations [34]	Balkans and Middle East
Lilium giganteum Wallich.	Liliaceae	Leaf in wounds and bruises [34]	Himalayan region
Limnophila aromatica (Lam.) Merr.	Plantaginaceae	Antiseptic, febrifuge, given to nursing mothers [34]	Tropical and subtropical Asia
Limnophila indica (L.) Druce.	Plantaginaceae	Antiseptic, leaf in dyspepsis and dysentery [34]	Pantropical
Lindenbergia indica (L.) Vatke.	Orobanchaceae	Chronic bronchitis, skin eruptions [34]	India to west Asia
Lindernia crustacea (L.) F. Muell.	Linderniaceae	Dysentery, boils, sores, itch and ringworm [34]	Tropical and subtropical areas
Lindernia pyxidaria L.	Linderniaceae	Gonorrhoea [34]	Terrestrial
Lippia adoensis Hochst. ex Walp.	Verbenaceae	Leaf in various skin diseases [126]	Africa, South and Central America
Lippia javanica Spreng.	Verbenaceae	Leaf and root in skin diseases [67]	Many parts of Africa
Liquidambar orientalis Mill.	Hamamelidaceae	Stimulant, expectorant, antiseptic [34]	Western Asia
Lithospermum officinale L.	Boraginaceae	Root in smallpox, measles, itches, seed diuretic, blooder diseases [34]	Europe, Iran, the Caucasus
Litsea glutinosa (Lour.) C.B.Rob.	Lauraceae	Leaf and flower in bruises and wounds [34]; orally in acni, summer itches [32]	India, China to Malaysia, Australia
Litsea lancifolia Hook.f.	Lauraceae	Bark in sprains and bruises [34]	Bhutan, India to Vietnam
Lobaria pulmonaria L. (Hoffm.)	Lobariaceae	Plant in eczema [34]	Europe, Asia, North America, Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Lobelia inflates L.	Campanulaceae	Asthma and bronchitis [34]	Eastern North America
Lobelia nicotianifolia L.	Campanulaceae	Used as antiseptic [34]	India and Sri Lanka.
Lobelia cardinalis L.	Campanulaceae	Root and flower antimicrobial [127]	Americas
Lobostemon fruticosus H.Buek.	Boraginaceae	Leaf and twig in wounds, skin diseases [56]	Some African countries
Lonicera glauca Hook. Fil. & Thomson	Caprifoliaceae	Leaf and flower in veneral diseases [34]	Southwest Asia, Iran to Kashmir valley
Luffa acutangular (L.) Roxb.	Cucurbitaceae	Leaf in haemorrhoids, leprosy, spleenitis, conjunctivitis, uraemia, amenorrhoea [34]	Asia
Luffa acutangular (L.) *var amara* (Roxb.)	Cucurbitaceae	Diuretic, in asthma, skin troubles, splenic enlargement, seed expectorant, fruit in jaundice [34]	India
Luffa cylindrica M. Roem.	Cucurbitaceae	Aerial part in leprosy [52, 78]	South Asia and Southeast Asia
Luffa echinata Roxb.	Cucurbitaceae	Fruits in dropsy, nephritis, chronic bronchitis, lung complaints [34]	Indian subcontinent, Africa
Lupinus varius L.	Fabaceae	Seed and flower antimicrobial [40]	Part of Africa, Europe
Luisia tenuifolia Blume.	Orchidaceae	Boils, abscesses, tumors [34]	Tropical Asia
Lumnitzera racemose Willd.	Combretaceae	Stem juice in itches and herpes [34]	East Africa, east Asia
Lychnis coronaria (L.) Desr.	Caryophyllaceae	Root in liver and lung complaints, infraction of mesenteric lymph glands [34]	Asia and Europe
Lycopodium clavatum L.	Lycopodiaceae	Problems of skin, liver, kidney, urinary tract, general infections, gout in Austria [76]	Pantropic
Lycoris aurea Herb.	Amaryllidaceae	Bulbs in burns in Chinese medicine [34]	China, Japan
Lygodium flexulosum (L.) Sw.	Lygodiaceae	Root as expectorant, rheumatism, sprains, eczema, wounds, carbuncles [34]	China, India to Malaysia, Australia
Lygodium microphyllum (Cav.) R.Br.	Lygodiaceae	Leaf in dysentery, skin diseases [34]	Tropical Africa, South East Asia, Australia
Lyonia ovalifolia (Wall.) Drude.	Ericaceae	Leaf and buds in cutaneous troubles [34]	China, Nepal to Malaysia
Macaranga peltata Roxb. Muell.	Euphorbiaceae	Veneral sores, leaf and bark vulnerary [34]	Thailand, Sri Lanka, India
Macaranga pustulata King ex Hook.f.	Euphorbiaceae	Bark and leaf in cuts, wounds [47]	China, India to Malaysia
Machilus macrantha Nees.	Lauraceae	Bark in asthma, rheumatism, leaf to ulcers [34]	Western Ghats of India, Sri Lanka
Madhuca longifolia (J.König.) J.F.Macbr.	Sapotaceae	Oil in skin affections [34]; antiseptic, used in skin diseases [33]	India, Sri Lanka, Nepal, Myanmar
Maerua crassifolia Forssk.	Capparaceae	Leaf antimicrobial [39]	Africa, tropical Arabia, Israel
Maesa ramentacea (Roxb.) A. DC.	Primulaceae	Leaf in itches, skin affections [34]	India to Malaysia
Mallotus philippensis (Lam.) Muell. Arg.	Euphorbiacea	Fruit in skin diseases like ringworm, scabies [33]	South east Asia, Australia
Malva parviflora L.	Malvaceae	Seed in cough, ulcer of the bladder [34]; septic wounds, inflammation [56]	Northern Africa, Europe, Asia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Malva sylvestris L.	Malvaceae	Pulmonary and urinary affections, inflammations, abscesses, flowers as gargle [34]	Western Europe, North Africa, Asia
Mandragora autumnalis Bertol.	Solanaceae	Fruit antimicrobial [40]	Mediterranean region
Mangifera indica L.	Anacardiaceae	Bark, leaf, unripe food antimicrobial [36]	Indian subcontinent
Marrubium vulgare L.	Lamiaceae	Leaf, flowering tops in cough, cold, pulmonary affections [34]	Europe, northern Africa, part of Asia
Martynia annua L.	Martyniaceae	Leaf in glandular tuberculosis, gargle in sore throat, fruit in inflammation [34]	Tropical America, Indian subcontinent
Matricaria chamomilla L.	Asteraceae	Expectorant, diuretic, neuralgia, debility, intermittent fever, eczema, bruises, sores, piles [34]	Europe, temperate Asia
Melaleuca leucadendron L.	Myrtaceae	Oil expectorant, chronic laryngitis, bronchitis [34]	Northern Australia, southeast Asia
Melastoma malabathricum L.	Melastomataceae	Bark and leaves in skin troubles [34]	Japan, India to Malaysia
Melia azedarach L.	Meliaceae	Leaf, flower, bark, root in eczema and various skin diseases [56, 67]	India to Malaysia, Australia
Melianthus comosus Vahl.	Melianthaceae	Leaf and stem in slow healing wounds, leaf in sores and bruises [34]	Southern Africa
Melianthus major L.	Melianthaceae	Leaf in foul ulcers, gargle in sore throat, gum troubles [34]	South Africa
Melissa officinalis L.	Lamiaceae	Leaf antimicrobial [41]	Part of Europe, Asia, Mediterranean Basin
Melissa parviflora Benth.	Lamiaceae	Antitubercular, antipyretic, fruit as brain tonic [34]	Bhutan, Nepal, India to Vietnam
Melothria indica Lour.	Cucurbitaceae	Leaf in thrush and eye troubles [34]	China, India to Malaysia
Mentha longifolia (L.) Huds.	Lamiaceae	Leaf antiseptic, stimulant, fever [34]	Europe, part of Asia and Africa
Menyanthes trifoliata L.	Menyanthacea	Tonic, febrifuge, skin affections [34]	Asia, Europe, North America
Meriandra bengalensis (J.Koenig ex Roxb.) Benth.	Lamiaceae	Tonic, antiseptic, sore throat, aphthae [34]	Ethiopia, Saudi Arabia, India
Meriandra strobilifera Benth.	Lamiaceae	Leaf in ulcers and skin abrations [34]	Western Himalayas of India
Merremia mammosa (Lour.) Hallier f.	Convolvulaceae	Tuber in diabetes, affection of throat and respiratory organs [34]	Southeast Asia
Merremia umbellate (L.) Hallier f.	Convolvulaceae	Fistula, pustule, tumors, burns, scalds, sores, seed in cutaneous diseases [34]	Tropical and subtropical Africa, Asia
Microglossa pyrifolia (Lam.) Kuntze.	Asteraceae	Root in cataract, leaf in yellow fever, Malaria, dropsy, eye sores, ringworm of scalp [34]	India to Malaysia, Africa
Micromelum integerrimum (Buch.-Ham.) ex Roem.		Bark of stem and root in tuberculosis [34]	Nepal, India to Myanmar
Micromelum pubescens (Burm.f.) B.L.Rob.	Asteraceae	Leaf in cuts and wounds [28]	East Africa
Mikania cordata (Burm.f.) B.L.Rob.	Asteraceae	Leaf in wounds [34]	East Africa, tropical East Asia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Mikania scandens (L.) Willd.	Asteraceae	Leaf in wound healing [32, 132]	Part of United States, southern Asia
Mimosa pudica L.	Fabaceae	Root in urinary complaints, leaf in sinus, sores and piles [34]	South and central America
Mirabilis jalapa L.	Nyctaginaceae	Leaf as tonic in China; boils, abscesses, wounds and bruises [34]	Tropical south America
Moghania macrophylla (Willd.) Kuntze.	Fabaceae	Root in medicine of ulcers and sweelings [34]	Asia
Mollugo cerviana (L.) Ser.	Molluginaceae	Plant antiseptic, flowers and tender shoots febrifuge [34]	Part of Europe, Africa, Asia, Australia
Mollugo pentaphylla L.	Molluginaceae	Antiseptic, in sore legs [34]	Pantropical
Momordica balsamina L.	Cucurbitaceae	Fruit and seed in burns [67]	Tropical Africa
Momordica charantia L.	Cucurbitaceae	Leaf in leprosy [42]	Asia, Africa, Caribbean islands
Momordica cochinchinensis (Lour.) Spreng.	Cucurbitaceae	Seed in ulcers; fruit and leaf in fracture and ulcers [34]	China, India, Malaysia
Momordica dioica Roxb. *ex* Willd.	Cucurbitaceae	Root in piles, bowel affections, urinary complaints [34]	Pakistan, India, Sri Lanka
Moringa oleifera Lam.	Moringaceae	Seed and leaf in leprosy, cuts, wounds, snake and dog bite wounds [52, 28]	Himalayas in northwestern India
Morus alba L.	Moraceae	Leaf in wound healing, antiseptic and disinfectant [42]	Northern China
Morus laevigata Wall. ex Brandi.	Moraceae	Juice of the plant on sores [34]	Tibet, Himalayas, Indochina
Mucuna monosperma Wight.	Fabaceae	Seed in asthma, coughs and tongue infections [34]	India to Malaysia
Murraya paniculate (L.) Jack.	Rutaceae	Leaf in diarrhea, dysentery, wounds, leaf and root bark in cough, rheumatism, hysteria [34]	China, Indian sub-continent, Australia
Mussaenda frondosa L.	Rubiaceae	Shoot in children for cough, root in white leprosy, eye troubles [34]	India to Malaysia
Mussaenda glabra Vahl.	Rubiaceae	Leaf, root in cough; flower diuretic, in asthma, recurrent fevers [34]	Tropical Africa, Asia, Malaysia
Myrica esculenta Buch.-Ham. ex D.Don	Myricaceae	Bark antiseptic, diuretic, in asthma, diarrhea, fevers, lung affections, putrid sores [34]	Bhutan, India, Myanmar to Vietnam
Myristica malabarica Lam.	Myristicaceae	Seed in indolent ulcers [34]	India
Myrothamnus flabellifolius Welw.	Myrothamnaceae	Leaves and twigs in burns and wounds [45, 55]	Southern Africa
Myroxylon balsamum (L.) Harms.	Fabaceae	Oil antiseptic, stimulant, expectorant [34]	Americas
Myroxylon pereirae Klotzsch.	Fabaceae	Antiseptic, in wounds, indolent ulcers, expectorant, ringworm, haemorrhoids [34]	Central and south America
Myrsine Africanab L.	Primulaceae	Part of ointment for ringworm and other skin affections [34]	Macaronesia, Africa, South Asia
Myrtus communis L.	Myrtaceae	Leaf, berries, oil antiseptic, in diseases of respiratory, bladder, stomach, liver, apthae, internal ulceration [34]	Mediterranean region in southern Europe

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Nardostachys jatamansi (D.Don) DC.	Caprifoliaceae	Rhizome tonic, stimulant, in leprosy [34]	Eastern Himalayas
Naregamia alata Wight & Arn.	Meliaceae	Root in chronic bronchitis [34]	Peninsular India
Nasturtium officinale W.T. Aiton.	Brassicaceae	Polypus of nose, diuretic, asthma, tuberculosis [34]	Parts of Europe and Asia
Nauclea missionis Wall. ex G. Don.	Rubiaceae	Bark in rheumatism, skin troubles [34]	India
Nauclea orientalis (L.) L.	Rubiaceae	Bark tonic, antipyretic, vulnerary [34]	Southeast Asia, Australia
Neolitsea umbrosa (Nees) Gamble.	Lauraceae	Oil of fruit on skin affections [34]	South east Asia
Nepenthes khasiana Hook.f.	Nepenthaceae	Liquid of the pitcher used in for urinary and eye troubles [34]	India
Nepeta ciliaris Benth.	Lamiaceae	Leaf and seed in coughs, fevers [34]	India
Neptunia oleracea Lour.	Fabaceae	Stem in ear ache, root in Syphilis [34]	South America
Nigella sativa L.	Ranunculaceae	Seed as stimulant, diuretic, galactogogue, in skin affections [34]	South and southwest Asia
Nopalea cochenillifera (L.) Salm-Dyck	Cactaceae	Fruit in rheumatism, scalds, burns, skin diseases, ear ache and tooth ache [34]	Mexico
Nyctanthes arbor-tristis L.	Oleaceae	Leaf expectorant, diuretic, fever, rheumatism; bark expectorant, seed in scalp affections [34]	South and Southeast Asia
Nymphaea nouchali Burm. f.	Nymphaeaceae	Rhizome in dysentery, flower as cardiotonic, seed in cutaneous diseases [34]	Southern and eastern parts of Asia
Nymania capensis (Thunb.) Lindb.	Meliaceae	Root in wounds [45]	South Africa
Nymphaea caerulea Sav.	Nymphaeaceae	Leaf and stem in skin rash and inflamed wounds [45]	East Africa, Indian subcontinent
Nypa fruticans Wurmb.	Arecaceae	Leaf in ulcers, young shoots in herpes [34]	Coastlines of Indian and Pacific Oceans
Ochna pumila Buch.-Ham. ex D. Don.	Ochnaceae	Root in epilepsy, leaf on sores [34]	Tropical Asia
Ochna serrulata (Hochst.) Walp.	Ochnaceae	Root in gangrenous wounds [67]	South Africa
Ochradenus baccatus Delile.	Resedaceae	Fruit antimicrobial [39]	India, Pakistan, Syria, Egypt, Libya
Ocimum basilicum L.	Lamiaceae	Stimulant, antipyretic, expectorant, antifungal; seeds diuretic, piles, sores, sinuses [34]	India
Ocimum gratissimum L.	Lamiaceae	Tonic, diuretic, expectorant, styptic, antiseptic [34]	Africa, Madagascar, southern Asia
Ocimum sanctum L.	Lamiaceae	Leaf stimulant, in bronchitis, skin infections, root in malaria, seed in urinary tract disorders [34]	Indian subcontinent
Olea europaea L.	Oleaceae	Leaf extract and oil antimicrobial [128]	Mediterranean regions, Africa, Himalayas
Olinia rochetiana A. Juss.	Penaeaceae	eczema, acne and scabies [129]	Some African countries

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Ophioglossum vulgatum L.	Ophioglossaceae	Styptic, antiseptic, vulnerary, rhizome on boils [34]	Throughout temperate regions
Ophiorrhiza mungos L.	Rubiaceae	Root tonic, used in cancer treatment, leaf in ulcers [34]	India, Myanmar, Sri Lanka
Opopanax chironium W.D.J.Koch.	Apiaceae	Gum resin from root stimulant and antiseptic [34]	Warm climatic areas
Opuntia ficus-indica (L.) Mill.	Cactaceae	Skin rash, ulcers, furuncles, fresh wounds and warts [37, 45]	Probably Mexico
Origanum vulgare L.	Lamiaceae	Leaf oil diuretic, tonic, in whooping cough, bronchitis, rheumatism, tooth and ear ache [34]	Temperate Eurasia, Mediterranean region
Oroxylum indicum (L.) Benth. ex Kurz.	Bignoniaceae	Root bark tonic, in diarrhoea, dysentery, otorrhoea; plant antiseptic [34]; wound healing [59]	Himalayan foothills
Orthosiphon glabratus Benth.	Lamiaceae	Diarrhea, piles, leaves febrifuge, in cuts and wounds [34]	India to Malaysia
Osbeckia chinensis L.	Melastomataceae	Diarrhea, wounds, root expectorant [34]	China, Japan, India to Malaysia, Australia
Osmitopsis asteriscoides L.	Asteraceae	Leaf in inflammation and cuts [55]	African countries
Osmunda regalis L.	Osmundaceae	Roots tonic, styptic, antibacterial, in dysentery, rickets, muscular debility [34]	Parts of Europe, Africa, Asia
Oxystelma esculentum (L. fil.) R. Br.	Apocynaceae	Herb antiseptic, galactogogue, as gargle, fresh root at jaundice, latex vulnerary [34]	West Asia to Malesia
Ozoroa engleri R.Fern. & A.Fern.	Anacardiaceae	Bark, root and leaf in skin infection [130]	South Africa
Paederia foetida L.	Rubiaceae	Leaf in herpes, diuretic, root in piles, pain of visceral organs, elimination of collected poisons from the body [34]	Asia
Pandanus odorifer (Forssk.) Kuntze.	Pandanaceae	Leaf in leprosy, diseases of heart and brain; anthers in diseases of the blood [34]	Polynesia, Australia, south Asia
Pandanus utilis Bory.	Pandanaceae	Root in veneral diseases [34]	Madagascar, Mauritius, Seychelles
Panicum antidotale Retz.	Poaceae	Affection of the throat, antidote in hydrophobia [34]	Himalaya and upper Gangetic plain, India
Parameria barbata (Bl.) K. Schumann.	Apocynaceae	Bark for shrinking of uterus, dysentery, wounds [34]	India to Malaysia
Parkia roxburghii G. Don.	Fabaceae	Bark and leaf in sores and skin affections [34]	Thailand, Malaysia, Myanmar,India
Paronychia argentea Lam.	Caryophyllaceae	Aerial parts antimicrobial [40]	Around the Mediterranean sea
Passiflora incarnate L.	Passifloraceae	Plant sedative, in ulcers and haemorrhoids [34]	America
Pavetta indica L.	Rubiaceae	Root tonic, in jaundice, urinary diseases, leaf in ulcerated nose and haemorrhoids [34]	India, Sri Lanka
Pavonia odorata Willd.	Malvaceae	Root antipyretic, in dysentery and intestinal haemorrhage [34]	India, Pakistan, Burma, Srilanka, Africa
Pedalium murex L.	Pedaliaceae	Dysuria, gonorrhoea, diseases of the genito-urinary system [34]	Tropical Africa, Indian subcontinent
Pedilanthus tithymaloides Poit.	Euphorbiaceae	Latex in veneral diseases, warts and Leucoderma patches [34]	Tropical and central America

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Peganum harmala L.	Nitrariaceae	Seed in asthma, gallstone, fever, jaundice, antimicrobial [33]	India and Pakistan
Pelargonium alchemilloides (L.) L'Hér.	*Geraniaceae*	Leaf in wounds and abscesses [56, 67]	Africa, Arabian Peninsula
Pellaea calomelanos (Sw.) Link.	Pteridaceae	Leaf and rhizome in boils and abscesses [56, 67]	Eastern and southern Africa, Madagascar
Peltophorum pterocarpum (DC.) K.Heyne.	Fabaceae	Bark in dysentery, part of gargles, tooth powder, lotion, eye troubles, sores [34]	Tropical southeastern Asia
Pentanema indicum L.	Asteraceae	Plant in skin diseases [38]	Africa, China, Indian subcontinent
Pentanisia prunelloides (Klotzsch) Walp.	Rubiaceae	Root in burns and swellings [55]	Southern Africa
Pergularia daemia (Forssk.) Chiov.	Asclepiadaceae	Uterine, menstrual troubles, root and leaf in asthma, diarrhoea, leaf in carbuncles [34]	Tropical Africa, Asia
Pentatropis spiralis (Forssk.) Decne.	Asclepiadaceae	Root in gonorrhoea [34]	Parts of Africa, Pakistan, India
Peristrophe bicalyculata (Retz.) Nees.	Acanthaceae	Essential oil anti tubercular [34]	India, Afghanistan, Africa
Peristrophe bivalvis (L.) Merr.	Acanthaceae	Leaf in cough, dysentery, diarrhoea and bronchitis in Chinese medicine [131]	Southeastern Asia
Persea Americana Mill.	Lauraceae	Fruit contain important nutrients, roots yields antibacterial as food preservative [34]	South central Mexico
Phaulopsis dorsiflora (Retz.) Santapau.	Acanthaceae	Fresh juice in sores, plant in dressing of wounds [34]	India to Vietnam
Phoenix dactylifer L.	Arecaceae	Fruits in respiratory diseases and fever [34]	Lands around Iraq
Phyla nodiflora (L.) Greene.	Verbenaceae	Diuretic, febrifuge, in boils, swollen glands, erysipelas, indolent ulcers [34]	Tropical and subtropical part of the world
Phyllanthus fraternus G.L.Webster	Phyllanthaceae	Diuretic, febrifuge, in diarrhoea, dysentery, diseases of the uro-genital system, fresh root in jaundice, as galactogogue, latex to sores [34]	Pantropical
Phyllanthus reticulatus Poir.	Phyllanthaceae	Leaf in sores, burns and skin irritations [56,67]	Asia
Phyllanthus simplex Retz.	Phyllanthaceae	Antiseptic; leaf in gonorrhea, eye troubles, root preparation in mammary abscess [34]	China, India to Malaysia
Phyllanthus urinaria L.	Phyllanthaceae	Diuretic, febrifuge, diseases of the uro-genital system, root in jaundice, latex to sores [34]	Tropical world
Phytolacca americana L.	Phytolaccaceae	Leaf in wounds and swellings [67]	Eastern United States, Canada
Phytolacca octandra L.	Phytolaccaceae	Leaf in septic wounds [67]	Mexico, central America
Phytolacca dodecandra L. Her.	Phytolaccaceae	Fruit in eczema [129]	Tropical and southern Africa
Picrasma javanica Blume.	Simaroubaceae	Bark febrifuge, leaf in sores [34]	Northeast India to Indochina and Malaysia
Picrorhiza kurrooa Royle ex Benth.	Plantaginaceae	Rhizome in gastric problems, leprosy [33]	Himalayan region
Picrorhiza scrophulariiflora Pennell.	Plantaginaceae	Root in wound healing [59]	India to southwestern China

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Pilea microphylla (L.) Liebm.	Urticaceae	Gastric and intestinal troubles, diuretic, leaf on sores and bruises [34]	South America
Pimpinella tirupatiensis N.Balakr.& Subram.	Apiaceae	Root and tuber in abscess [38]	Southeast India
Pinus roxburghii Sarg.	Pinaceae	Oil disinfectant, in chronic bronchitis, gangrene of lungs [34]	Himalayan region
Piper betel L.	Piperaceae	Leaf in wounds, root with black pepper for women sterility, leaf oil in respiratory catarrah, diphtheria [34]	South and Southeast Asia
Piper cubeba L.f.	Piperaceae	Dysentery, diuretic, gonorrhoea, bronchial troubles [34]	Southeast Asia to Indonesia
Piper longum L.	Piperaceae	Roots and fruits in diseases of respiratory tract [34]; plant antiseptic [33]	Indian subcontinent
Piper nigrum L.	Piperaceae	Seed antimicrobial [33]	South India
Piper peepuloides Roxb.	Piperaceae	Stems and roots in leprosy [34]	Himalayan region
Pipturus incanus (Blume) Wedd.	Urticaceae	Leaf in boils, burns, herpes, gurgle in thrush [34]	Peninsular Malaysia, Australia
Pistacia integerrima J.L.Stewart ex Brandis.	Anacardiaceae	Leaf gall in dysentery, asthma, phthisis ond othe respiratory diseases [34]	Himalayan region
Pistia stratiotes L.	Araceae	Leaf juice boiled in coconut oil to chronic skin diseases [34]	Pantropical
Pithecellobium clypearia (Jack) Benth.	Fabaceae	Leaf on pox pustules, leaf ash in coconut oil on skin affections [34]	India, Sri Lanka
Pithecolobium dulce (Roxb.) Benth.	Fabaceae	Bark, pulp and seed antimicrobial [36]	Pacific coast of Americas
Pittosporum dasycaulon Miq.	Pittosporaceae	Bark anti bacterial and antifungal [34]	Western ghat, India
Pittosporum floribundum Wight & Arn.	Pittosporaceae	Bark febrifuge, in chronic bronchitis and leprous affections [34]	Some African countries
Plantago afra L.	Plantaginaceae	Leaves and seed in suppurating wounds, pustules, eczema, furuncles and itching [67]	Mediterranean region, western Asia
Plantago amplexicaulis Cav.	Plantaginaceae	Seed in intermittent fever, pulmonary affections, ophthalmia [34]	Southern Europe to Western Asia
Plantago asiatica L.	Plantaginaceae	Seed in haematuria, diseases of gastro-intestinal and geniti-urinary tracts [34]	East Asia
Plantago himalaica Pilger.	Plantaginaceae	Leaf in wounds [34]	Pakistan to Nepal
Plantago lanceolata L.	Plantaginaceae	Leaf & root vulnerary, in pulmonary diseases, leaf antibacterial, seed diuretic, haemostatic [34]	Eurasia
Plantago major L.	Plantaginaceae	Leaf febrifuge, diuretic, vulnerary, diarrhoea, piles, eye wash, root febrifuge, diuretic, tonic [34]	Europe, northern and central Asia
Plantago ovata Frossk.	Plantaginaceae	Seed febrifuge, in affections of kidney, bladder and urethra [34]	Western and Southern Asia
Plantanus orientalis L.	Plantanaceae	Bark antirheumatic, in diarrhoea and dysentery [34]; plant in Leprosy [78]	Southeast Europe to west Asia
Platycodon grandifloras (Jacq.) A.DC.	Campanulaceae	Root tonic, expectorant, in throat ailment [34]	East Asia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Plectranthus asirensis J.R.I. Wood.	Lamiaceae	Essential oil antimicrobial [39]	Sub-Saharan Africa, Madagascar, India
Plectranthus amboinicus (Lour.) Spreng.	Lamiaceae	Antiseptic, antimicrobial, diuretic, tonic [133]	Southern and Eastern Africa
Plectranthus macranthus Hook.f.	Lamiaceae	Used in sores [34]	India, Myanmar,Vietnam
Pleopeltis lanceolata Kaulf.	Polypodiaceae	Cold, sore throat [34]	South America
Pluchea indica (L.) Less.	Asteraceae	Leaf in atonic and gangrenous ulcers [34]	Parts of Asia and Australia
Plumbago auriculata Lam.	Plumbaginaceae	Black water fever, root in glandular tuberculosis [34]	South Africa
Plumbago coccinea (Lour.) Salisbury.	Plumbaginaceae	Root in leucoderma, syphilis and leprosy [34]	Southeast Asia
Plumbago zeylanica L.	Plumbaginaceae	Root diuretic, in piles, diarrhoea, skin diseases, influenza, black water fever [34]	Pantropical
Plumeria acuminata W.T.Aiton.	Apocynaceae	Bark stimulant, febrifuge, in veneral affections, anti herpetic [34]	Mexico, central America
Plumeria alba L.	Apocynaceae	Latex in ulcers, herpes, seed haemostatic, bark stimulant, febrifuge, in veneral affections [34]	Central America and the Caribbean
Podophyllum hexandrum Royle.	Berberidaceae	Resin with anti-cancer activity [34]; Rhizome in skin diseases [33]	Himalayan region
Pogostemon benghalensis (Burm.f.) Kuntze.	Lamiaceae	Shoot and whole plant in wounds [134]	Indian subcontinent
Polygala chinensis L.	Polygalaceae	Leaf in asthma, chronic bronchitis and catarrhal affections [34]	India to Malaysia and China
Polygala senega L.	Polygalaceae	Chronic bronchitis and asthma [34]	North America
Polygala sibirica L.	Polygalaceae	Root in colds, coughs, chronic chest troubles, diarrhoea, inflammation of urinary bladder, externally in mammary abscess and carbuncles [34]	East Europe to east Asia
Polygonatum cirrhifolium (Wall.) Royle.	Asparagaceae	Used as tonic and vulnerary [34]	Native to China
Polygonatum multiflorum (L.) All.	Asparagaceae	Rhizome tonic, in bruises, piles, tumors, scar discoloation of skin [34]	Europe and temperate Asia
Polygonum aviculare L.	Polygonaceae	Tonic, antipyretic, diuretic, haemostatic, in diabetes, rheumatism, ulcer, diarrhoea [34]	Eurasia and North America
Polygonum bistorta (L.) Samp.	Polygonaceae	Febrifuge, diuretic, expectorant, hemostatic [34]; infectious diseases, antiseptic, disinfectant [75]	Europe, north and west Asia
Polygonum chinense L.	Polygonaceae	Herb tonic and vulnerary [34]	China, Japan, India to Malaysia
Polygonum hydropiper L.	Polygonaceae	Contraceptive, uterine disorder, tonic, diuretic, in skin affections [34]	Almost pantropical
Polygonum orientale L.	Polygalaceae	Tonic and vulnerary, nut in tuberculosis [34]	China to the Himalayas
Polygonum persicaria L.	Polygalaceae	Styptic, vulnerary, lithontriptic, in colds, fever, asthma, gargle of pharynx [34]	Eurasia
Polygonum plebeium R.Br.	Polygalaceae	Bowel complaints, pneumonia [34]	South Asia including India

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Polygonum viviparum L.	Polygalaceae	Tonic, diarrhoea, dysentery, hemoptysis, gargle and lotion of ulcers [34]	Almost pantropical
Polyscias fruticosa (L.) Harms	Araliaceae	Leaf and root diuretic, in dysuria, stones and gravels, leaf vulnerary [34]	Southeastern Asia
*Pometia pinnata*J.R.Forst. & G.Forst.	Sapindaceae	Bark in festering sores [34]	India, Malaysia to Pacific islands
Pongamia pinnata (L.) Pierre.	Fabaceae	Seed oil in herpes, leucoderma, skin diseases, leaf in ulcers, sores, leprosy and gonorrhoea [34]	Asia
Portulaca oleracea L.	Portulacaceae	Vulnerary, diuretic; diseases of liver, spleen, kidney, bladder, mouth ulcer, burns and scalds [34]	Old World countries
Portulaca pilosa L.	Portulacaceae	Asthma, cough, urinary problems, ulcers, haemorrhoids, erysipelas [34]	Southern United States to Brazil
Portulaca tuberosa Roxb.	Portulacaceae	Plant in disuria, leaf in erysipelas [34]	India, Pakistan, Srilanka
Potentilla anserine L.	Rosaceae	Tonic, vulnerary, diarrhoea, leucorrhoea, kidney stones, arthritis, cramps [34]	Temperate Northern Hemisphere
Pothos scandens L.	Araceae	Leaf in smallpox, root boiled in oil for abscess [34]	India to Malaysia and Madagascar
Pouzolzia zeylanica (L.) Benn. & R. Br.	Urticaceae	Leaf galactogogue, vulnerary, in gangrenous ulcers, herb in sores and boils [34]	Tropical Asia
Premna herbacea Roxb.	Lamiaceae	Leaf in fever, cough, rheumatism, boils [34]	China to tropical Asia
Premna tomentosa Willd.	Lamiaceae	Leaf diuretic, vulnerary, in dropsy, after parturition, bark in diarrhoea, root in stomach ache [34]	Peninsular India and Sri Lanka
Prinsepia utilis Royle.	Rosaceae	Leaf in cuts, wounds, burns [47]	Himalayas from Pakistan to China
Prismatomeris tetrandra (Roxb.) K. Schum.	Rubiaceae	Leaf in stomach ache, wounds [34]	Cambodia, India, Thailand, Vietnam
Priva cordifolia (L.f.) Druce.	Verbenaceae	Seed in sores and wounds [67]	Indian subcontinent, Africa
Prunus amygdalus Batsch.	Rosaceae	Kernel lithontropic, diuretic, peptic ulcer, irritable sores, skin eruptions [34]	Middle East, Indian subcontinent, Africa
Prunus persica (L.) Batsch.	Rosaceae	Leaf or bark in whooping cough [34]	Northwest China
Prunus serotina Ehrh.	Rosaceae	Bark in phthisis, bronchitis [34]	North and south America
Pseuderanthemum bicolor (Schrank) Radlk.	Acanthaceae	Root, stem and leaf in aphthae and wound [34]	India to Malaysia, Philippines Cuba *etc.*
Psidium guajava L.	Myrtaceae	Leaf in boils, ulcers and wounds [56,67]	Caribbean, Central and South America
Psychotria Montana Blume	Rubiaceae	Root in preparation for ulcer, lotion for enlarged spleen, as febrifuge [34]	India to Malaysia
Psychotria sarmentosa Blume.	Rubiaceae	Leaf on sores [34]	India to Malaysia
Psychotria viridiflora Reinw. ex Blume	Rubiaceae	Leaf, bark and stem in skin affections [34]	India to Malaysia
Pteris multifida Poiret.	Pteridaceae	Rhizome and frond in dysentery, toasted paste on cutaneous affections [34]	Japan, Korea, China, Vietnam

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Pterocarpus indicus Willd.	Fabaceae	Dropsy, bladder stone, diarrhoea, thrush, kino of bark on sores [34]	China, Japan, Myanmar to Malaysia
Pterocarpus marsupium Roxb.	Fabaceae	Resin in fever, toothache, leaf in boil, sore, skin diseases [33]	India, Nepal, Sri Lanka
Pterospermum acerifolium (L.) Willd.	Sterculiaceae	Flower in inflammations, ulcers, tumors, Leprosy [34]	Southeast Asia
Pueraria tuberosa (Willd.) DC.	Fabaceae	Root in wound healing [79]	India, Pakistan, Nepal
Pulicaria crispa (Forssk.) Oliv.	Asteraceae	Febrifuge, vulnerary, in bruises and sores of bull-ocks [34]	Dry parts of Asia and Africa
Pulicaria guestii Rech.f. & Rawi.	Astreaceae	Aerial parts antimicrobial [39]	Arabian peninsula
Punica granatum L.	Lythraceae	Flower buds in bronchitis [34]; pericarp antimi-crobial [41]	Iran and northeast Turkey
Pupalia lappacea (L.) Juss.	Amaranthaceae	Fruit with palm oil to boils; in cough and fever; ashes used in Leprosy [34]	Peninsular India, Sri Lanka, East Africa
Pyrola rotundifolia L.	Ericaceae	Antilithic; in excessive menstrual, bloody stools, haemorrhages, ulcers in the urinary tract [34]	Europe, Japan, Myanmar, Russia
Quassia indica (Gaertn.) Nooteboom.	Simaroubaceae	Wood infusion as tonic, bark febrifuge, in skin affections [34]	India, Myanmar, Sri Lanka
Quercus infectoria Oliv.	Fagaceae	Bark and acrons used in intertrigo, impetigo, eczema [34]	Greece, Asia Minor
Quisqualis indica L.	Combretaceae	Seed in fever, diarrhoea, ricket, skin diseases [34]	Asia
Radermachera xylocarpus (Roxb.) K. Schum.	Bignoniaceae	Wood resin in skin troubles [34]	India
Randia fasciculata (Roxb.) DC.	Rubiaceae	Leaf on sores [34]	China, India to Malaysia
Ranunculus arvensis L.	Ranunculaceae	Gout, asthma, intermittent fevers, having antibacterial activity [34]	Western Asia, Europe
Ranunculus sceleratus L.	Ranunculaceae	Asthma, rheumatism, cutaneous disorder, seed tonic, in kidney troubles [34]	Temperate North America and Eurasia
Rauvolfia caffra Sond.	Apocynaceae	Bark in measles, urticaria and other skin rashes [67]	South Africa to tropical Africa
Rauvolfia tetraphylla L.	Apocynaceae	Herb extract in castor oil to skin ailments [34]	Mexico, central and south America
Reissantia grahamii (Wight) Ding Hou.	Celastraceae	Root to control infection of respiratory tract [34]	India to Malaysia
Reissantia indica (Willd.) N. Hallé.	Celastraceae	Sap febrifuge; root bark in infection of respiratory tract [34]	India to Malaysia
Rhamnus nepalensis (Wall.) Lawson.	Rhamnaceae	Fruit muxed with vinegar and used in herpes [34]	China to the Himalayas
Rheum emodi L.	Polygonaceae	Root in cuts and wounds [135]	Sub-alpine and alpine Himalayas
Rhinacanthus nasutus (L.) Kurz.	Acanthaceae	Fresh root and leaf with lime in eczema, ringworm, leaf in cancer, root antiseptic [34]	India, Sri Lanka, Java, Madagascar

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Rhododendron campanulatum D.Don.	Ericaceae	Leaf in chronic rheumatism, syphilis and sciatica [34]	Himalayas from Kashmir to Bhutan
Rhus succedanea L.	Anacardiaceae	Galls of the branch expectorant, tonic, in diarrhoea, dysentery [34]	Asia, Australia, New Zealand
Rhynchosia beddomei Baker.	Leguminosae	Leaf in skin diseases [38]	India and some other Asian countries
Ricinus communis L.	Euphorbiaceae	Wounds, sores, boils [56, 67]; eczema, dermatitis [33]	Mediterranean basin, eastern Africa, India
Rosa banksiae W.T.Aiton.	Rosaceae	Root tonic, anthelmintic, leaf vulnerary [34]	China
Rosa chinensis Jacq.	Rosaceae	Hips in wounds, sprains and ulcers [34]	Southwest China
Rosa multiflora Thunb.	Rosaceae	Fruits in foul ulcers [34]	Eastern Asia
Rosa multiflora Thunb.	Rosaceae	Flower in wounds, injuries [52]	Eastern Asia
Rosmarinus officinalis L.	Lamiaceae	Leaf antimicrobial [41]	Mediterranean region
Rothmannia capensis Thunb.	Rubiaceae	Fruit in burns and wounds [67]	African countries
Rotula aquatica Lour.	Boraginaceae	Root diuretic, in piles, bladder stone, veneral diseases [34]	India
Rourea minor Leenh.	Connaraceae	Roots and twigs tonic, febrifuge, in pulmonary complaints, diabetes, ulcer, skin troubles [34]	India, Sri Lanka, Bangladesh, Malaysia
Rubia cordifolia L.	Rubiaceae	Roots tonic, antidysenteric, antiseptic [34]	Asia, Africa, Europe
Rubia tinctorum L.	Rubiaceae	Roots tonic, diuretic, lithonotropic, diseases of liver, spleen, arthritis, bed sores [34]	Europe
Rubus fruticosus L.	Rosaceae	Wound healing, antiseptic, disinfectant [42, 114]	Europe, part of Africa, Asia, Americas
Rubus moluccanus L.	Rosaceae	Root juice in fistula [34]	Himalayas, India to Malaysia, Australia
Rumex acetosa L.	Polygonaceae	Bronchial diseases, diuretic, cutaneous tumor, skin troubles, diarrhoea [34]	Europe, Northwest Africa, part of Asia
Rumex dentatus L.	Polygonaceae	Skin diseases [47]	Parts of Eurasia, north Africa
Rumex lanceolatus Thunb.	Polygonaceae	Leaf in abscesses, boils, bruises, tumours [56, 67]	Southern Africa
Rumex nepalensis Spreng.	Polygonaceae	Leaf infision in syphilis [34]	Part of Europe, Asia, Africa
Rumex nervosus Vahl.	Polygonaceae	Aerial part antimicrobial [39]	Part of Africa, Asia, Europe
Rungia parviflora Nees.	Acanthaceae	Root febrifuge, leaf on contusion [34]; in Leprosy, Small pox [47, 78]	Peninsular India
Rungia repens (L.) Nees.	Acanthaceae	Cough, fever, diuretic, mixed with castor oil for fungal infection of scalp [34]	India, Sri Lanka
Ruppia maritima L.	Ruppiaceae	Depurant and vulnerary [34]	Mediterranean region, Africa, Europe
Ruta chalepensis L.	Rutaceae	Aerial part antimicrobial [40]	Eurasia, North Africa
Sagittaria sagittifolia L.	Alismataceae	Tuber in cutaneous troubles, leaf in sore throat, breast inflammation [34]	Most of Europe, temperate Asia,USA
Salacia chinensis L.	Celastraceae	Root in diabetes, amenorrhoea, dysmenorrhoea, veneral diseases [34]	India to Malaysia
Salacia macrophylla Blume.	Celastraceae	Root given after parturition, leaf in eczema and abdominal pain [34]	India to Malaysia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Salacia oblonga Wall.	Celastraceae	Root bark in rheumatism, gonorrhoea, asthma, and ear troubles [34]	India, Sri Lanka
Salacia reticulate Wight.	Celastraceae	Root bark in gonorrhoea, itch, swelling [34]	Sri Lanka
Salix tetrasperma Roxb.	Salicaceae	Leaf in rheumatism, veneral diseases, bladder stone, piles, bark as febrifuge [34]	India to Malaysia, South China
Salvadora oleoides Decne.	Salvadoraceae	Leaf expectorant, fruit in spleenomegali, low fever, rheumatism [34]	India, Pakistan, southern Iran
Salvia coccinea Buc'hoz *ex* Etl.	Lamiaceae	In renal troubles and tuberculosis [34]	Central and south America
Salvia moorcroftiana Wall. *ex* Benth.	Lamiaceae	Leaf expectorant, in boils, wounds, skin affections; seed in dysentery, haemorrhoids [34]	Himalayan region
Salvia officinalis L.	Lamiaceae	General infectious diseases, antiseptic, disinfectant [75]	Mediterranean region
Sambucus nigra L.	Adoxaceae	Expectorant, diuretic, depurative, febrifuge, rheumatism, cold, inflamed throat, neuralgia [34]	Europe and North America
Sanicula europaea L.	Apiaceae	Pulmonary diseases, diarrhea, dysentery, menorrhagia, bleeding piles, in ulcer ointment [34]	Europe
Sansevieria trifasciata Prain.	Asparagaceae	Root tonic, leaf on sores [34]	Tropical west Africa
Santalum album L.	Santalaceae	Oil in cystitis, gonorrhoea, cough, tuberculosis [33]	India, Indonesia, Malaysia
Santolina chamaecyparissus L.	Asteraceae	Stimulant, analgesic, vermifuge, vulnerary [34]	Western and central Mediterranean
Sapindus trifoliatus L.	Sapindaceae	Fruit tonic, asthma, diarrhoea, cholera, tuberculosis, paralysis, root and bark expectorant [34]	South Asia
Sapium sebiferum (L.) Roxb.	Euphorbiaceae	Oil vulnerary, in skin troubles [34]	Eastern Asia
Saponaria officinalis L.	Caryophyllaceae	Expectorant, diuretic, tuberculosis, hepatic problems, veneral ulcers, skin troubles [34]	Europe, Asia to western Siberia
Saraca asoca (Roxb.) Willd.	Fabaceae	Uterine tonic, uterine affections, fibroid, haemorrhoids, haemorrhagic dysentery [34]	Indian subcontinent
Sarcostemma acidum (Roxb.) Voigt.	Apocynaceae	Root given after rabid dog bite [34]	India, Myanmar,Thailand,Vietnam
Sarcostigma kleinii Wight & Arn.	Icacinaceae	Bark in rheumatism, leprosy, hysteria [34]	India to Malaysia
Sarcostemma viminale (L.) L.	Apocynaceae	Latex in skin lesions, cuts, ulcers, septic wounds [45]	West Africa
Sassafras albidum (Nutt.) Nees.	Lauraceae	Root stimulant, diuretic, rheumatism, gout, scarvy, eye lotion, cutaneous troubles [34]	Eastern North America
Satureja hortensis L.	Lamiaceae	Oil for anti bacterial and anti fungal properties [34]	Southeastern Europe to western Asia
Saussurea heteromalla (D.Don) Hand.- Mazz.	Compositae	Leaf on wounds [34]	Hymalayan region
Saussurea hypoleuca Spreng. ex DC.	Asteraceae	Leaf in syphilis [34]	Himalayan region, western China
Saussurea costus (Falc.) Lipsch.	Asteraceae	Root tonic, in asthma, cough, rheumatism, chronic skin diseases [34]	South Asia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Saussurea obvallata (DC.) Edgew.	Asteraceae	Root used in preparation for wounds and cuts [34]	Himalayan region
Scabiosa columbaria L.	Dipsacaceae	Leaf and root in wounds [45, 55]	Europe
Scadoxus puniceus (L.) Friis & Nordal.	Amaryllidaceae	Bulb and root in wounds, ulcers, sores, allergies [56, 67]	Some African countries
Schima wallichii (DC.) Korth.	Theaceae	Leaf, bark and fruit in cuts and wounds [27, 105]	Himalayan region
Schinus molle L.	Anacardiaceae	Fruit stomachic, diuretic, in bronchial and urinary affections [34]	Western south America
Schizaea dichotoma (L.) Smith.	Schizaeaceae	Rhizome in respiratory problems, given after parturition [34]	Palaeotropics
Schleichera oleosa (Lour.) Merr.	Sapindaceae	Seed oil used in skin troubles, bark in ulcers [34]	India to Malaysia
Schrebera swietenioides Roxb.	Oleaceae	Leaf in splenomegaly, root in leprosy, bark in boils and burns, fruits in hydrocele [34]	India and Myanmar
Scilla natalensis Planch.	Hyacinthaceae	Bulb in boils and sores [67]	Southern Africa
Scoparia dulcis L.	Plantaginaceae	Fever, cough, bronchitis, tooth- ache, gravel and other renal troubles, diabetes [34]	Tropical and subtropical world
Securidaca longepedunculata Fresen.	Polygalaceae	Leaf and bark in wounds and sores [67]	Tropical and subtropical Africa
Sedum crassipes Wall.	Crassulaceae	Plant is vulnerary [34]	Hymalayan region
Sedum multicaule Wallich ex Lindley.	Crassulaceae	Plant is vulnerary [34]	Hymalayan region
Semecarpus anacardium Lf.	Anacardiaceae	Exudate in leprosy, nervous debility, fruit in ascitis, asthma, psoriasis, warts, tumors [34]	India
Senecio concolor DC.	Compositae	Leaf in cuts and wounds [58]	Some African countries
Senecio latifolius DC.	Compositae	Leaf in burns and wounds [58]	Some African countries
Senecio serratuloides DC.	Compositae	Leaf and stem in cuts, swelling, burns and sores [67]	Some African countries
Senecio tenuifolius Burm.f.	Asteraceae	Leaf vulnerary [34]	India and Indonesia
Senna alata (L.) Roxb.	Caesalpinioideae	Leaf juice in skin troubles [34]; wound healing, antibacterial [69]	Mexico
Senna italica Mill.	Fabaceae	Root in wounds, burns, furuncles [67]	African countries
Senna sophera (L.) Roxb.	Fabaceae	Leaf bark and seeds cathartic, leaf juice in ringworm [34]	Most tropical countries
Senna tora (L.) Roxb.	Fabaceae	Leaf purgative, in ringworm and other skin diseases [34]	Probably south Asia
Serissa foetida (L.f.) Lam.	Rubiaceae	Leaf in carbuncles, cancer [34]	Southeast Asia
Sesamum indicum L.	Pedaliaceae	Seed plaster in burns, scalds, fresh leaf in urinary, eye and skin affections [34]	Pantropic
Sesbania grandiflora (L.) Poiret.	Fabaceae	Expectorant, febrifuge, scbies, tonic, diuretic, ulceration of the tongue and alimentary canal [34]	Malaysia to North Australia
Sida acuta Burm.f.	Malvaceae	Haemorrhoids, importency, tonic, antipyretic, urinary disorders [34]	Central America

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Sida veronicaefolia Lam.	Malvaceae	Tonic, febrifuge, urinary complaints, gonorrhoea, cuts and bruises [34]	Southern China, Nepal
Sida cordifolia L.	Malvaceae	Seed as sex tonic and in gonorrhoea, root in fever, female diseases, wound healing [33]	India
Sida dregei Burtt Davy	Malvaceae	Leaf in sores [56, 67]	Some African countries
Sida rhombifolia L.	Malvaceae	Diuretic, febrifuge, rheumatism, skin troubles, tuberculosis [34]	New World tropics and subtropics
Sida spinosa L.	Malvaceae	Debility, fever, gonorrhea [34]	Pantropical
Sigesbeckia orientalis L.	Asteraceae	Ringworm, gangrenous ulcers and sores [34]	Africa, Asia
Silybum marianum (L.) Gaertn.	Asteraceae	Jaundice, calculi of gall bladder, intermittent fever, dropsy, uterine troubles, cancer [34]	Southern Europe
Smilax china L.	Smilacaceae	Tubers in veneral diseases, rheumatism, chronic skin infections [34]	China, Korea,Japan, Myanmar to India
Smilax glabra Roxb.	Smilacaceae	Root in sores and veneral diseases [34]	China, the Himalayas and Indochina
Smilax ovalifolia Roxb. ex D.Don	Smilacaceae	Root in veneral diseases, rheumatism, dysentery, urinary prublems [34]	Hymalayan region
Smilax zeylanica L.	Smilacaceae	Root in veneral diseases, sores, swelling, abscesses [34]	India to Malaysia
Solanum aculeatissimum Jacq.	Solanaceae	Fruit in skin complaints, root in tooth ache, seed smoke in ulcerated nose [34]	Africa, South America
Solanum aviculare G. Forst.	Solanaceae	Sores and ulcers [34]	New Zealand, Australia
Solanum dulcamara L.	Solanaceae	Tumors, warts, rheumatism and skin affections [34]	Europe and Asia
Solanum erianthum D.Don.	Solanaceae	Root in urinary troubles, vaginal discharge, glanders of horse [34]	Americas
Solanum ferox L.	Solanaceae	Antipyretic, sore throat, cough, asthma, rheumatism, dropsy [34]	Indonesia, Thailand, Philippines
Solanum giganteum Jacq.	Solanaceae	Leaf in festering sores [56, 67]	Africa, southern India, Srilanka
Solanum hermannii Dunal.	Solanaceae	Fruit, leaf and root in wounds, boils and non-specific skin infections [56, 67]	South Africa
Solanum incanum L.	Solanaceae	Leaf and root in wounds, furuncles, ringworm [67]	Sub-Saharan Africa, Middle East, India
Solanum indicum L.	Solanaceae	Root in cough, catarrhal affections, nasal ulcers [34]	Indian subcontinent
Solanum melongena L.	Solanaceae	Stimulant, in otitis, ulcer of nose, bronchitis, asthma [34]	Worldwide
Solanum nigrum L.	Solanaceae	Wounds, ulcers, septic pimples, furuncles, ringworm [33, 45]	Eurasia
Solanum panduriforme E.Mey.	Solanaceae	Plant sap in non-specific skin infections [67]	Some African countries
Solanum tomentosum L.	Solanaceae	Fruit in non-specific skin infections [67]	Some African countries
Solanum tuberosum L.	Solanaceae	Lef in cough, tuber paste in burns [34]	Andes mountain region
Solanum virginianum L.	Solanaceae	Asthma, cough, vesicular eruptions, sore throat, rheumatism [34]	India to Malaysia, Australia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Solena heterophylla Lour.	Cucurbitaceae	Leaf juice wound healing [136]	Himalayan region, Australia
Solidago virgaurea L.	Asteraceae	Asthma, whooping cough, internal lesions, chronic eczema, nephritis, old ulcers [34]	Part of Europe, Africa, Asia
Sonchus arvensis L.	Asteraceae	Roots in cough, bronchitis, latex in eye troubles [34]	Northern parts of Europe
Sonchus asper (L.) Hill.	Asteraceae	Wounds and bruises [34]	Europe, north Africa, western Asia
Sonchus oleraceus L.	Asteraceae	Wounds and ulcers [56]	Europe and western Asia
Sorbus aucuparia L.	Rosaceae	Diuretic, haemorrhoids, cough, bronchitis, leucorrhoea, diarrhea [34]	Most of Europe, Asia, northern Africa
Sparganium stoloniferum (Buch.-Ham.) Ex Juzepczuk.	Typhaceae	Fruit haemostatic, decoction vulnerary [34]	Southwest Asia, North America
Spathodea campanulate P.Beauv.	Bignoniaceae	Skin diseases, dysentery, renal troubles, urethral inflammations, gastro intestinal troubles [34]	Tropical Africa
Spergula arvensis L.	Caryophyllaceae	Diuretic; in pulmonary Tuberculosis [34]	Worldwide
Spergularia rubra (L.) C. Pres.	Caryophyllaceae	Cystitis, urethral pain [34]	Worldwide
Spermacoce natalensis Hochst.	Rubiaceae	Root in rash with fever [67]	Some African countries
Sphaeranthus indicus L.	Asteraceae	Styptic, tonic, hepatic and gastric disorders, chest troubles, Tuberculosis [34]; skin diseases [38]	India
Spinacia oleracea L.	Amaranthaceae	Diuretic; in fever, bowel inflammation, having antibacterial action [34]	Central and western Asia
Spondias mombin L.	Anacardiaceae	Expectorant, diuretic, febrifuge, eye troubles, vulnerary [34]	Tropical Americas
Spondias pinnata (L. f.) Kurz.	Anacardiaceae	Diarrhea, dysentery, rheumatism, irregular menstruation, Tuberculosis [34]	Malaysia, Philippines, Indochina
Stachys schimperi Vatke.	Lamiaceae	Aerial part antimicrobial [39]	Arab, Africa
Stachytarpheta jamaicensis (L.) Vahl.	Verbenaceae	Veneral diseases, ulcers, erysipelas, dropsy, stomach ailments, ulceration of nose [34]	Caribbean islands
Stemona tuberose Lour.	Stemonaceae	Tuberous root bacteriostatic, used in Pthysis and cough [34]	China, India, southeast Asia, New Guinea
Stephania glabra (Roxb.) Miers.	Menispermaceae	Pulmonary Tuberculosis, asthma, intestinal complaints [34]	Global distribution
Stephania abyssinica (Quart.-Dill. & A. Rich.) Walp.	Menispermaceae	Root in boils [56, 67]	Some African countries
Stephania japonica (Thunb.) Miers.	Menispermaceae	Root in fever, diarrhoea, dyspepsia, urinary diseases [34]	USA, southeast Asia, Pacific region
Sterculia setigera Del.	Sterculiaceae	Stem bark and seed in skin diseases [48]	Indian subcontinent
Sterculia urens Roxb.	Sterculiaceae	Bark to heal foot cracks [79]	India, Burma
Stereospermum suaveolens (Roxb.) DC.	Bignoniaceae	Tonic, intermittent and puerperal fevers, chest and brain affections [34]	South Asia
Streblus asper Lour.	Moraceae	Ulcers, sinuses, boils, dysentery, fever, sore heals, piles, leukoderma [34]	India to Malaysia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Strychnos cinnamomifolia Thwaites	Loganiaceae	Root in ulcers, rheumatism, fever, epilepsy [34]	Indo Myanmar, China
Strychnos ignatia Lindl.	Loganiaceae	Seed in Cholera, asthma, dropsy, rheumatism, piles [34]	Philippines, parts of China
Strychnos nux-vomica L.	Loganiaceae	Leaf on wound and ulcer, fresh wood juice in dysentery, fever, Cholera, dyspepsis [34]	India, southeast Asia
Strychnos potatorum L.f.	Loganiaceae	Tonic, diarrhoea, diabetes, Gonorrhoea, eye troubles [34]	India and Myanmar
Strychnos spinosa Lam.	Loganiaceae	Leaf in dermatitis, loss of fur, skin diseases [48]	Tropical and subtropical Africa
Symplocos racemosa Roxb.	Symplocaceae	Bark in eye infection, ulcer, wounds, elephantiasis, fat in urin [33]	China, south Asia
Symplocos paniculata Miq.	Symplocaceae	Bark tonic, in ulcer, wounds [33]	India, Japan, South Korea
Syzygium alternifolium Walp.	Myrtaceae	Fruit in wounds [38]	India
Styrax benzoin Dryand.	Styracaceae	Expectorant, diuretic; in indolent sores and ulcers of animals [34]	Sumatra, Indonesia
Sutherlandia frutescens (L.) R.Br.	Fabaceae	Leaf in problems of stomach, intestine, uterus, liver; in influenza, rheumatism, haemorrhoid, dropsy, eye trouble [34]	South Africa
Swertia chirayita (Roxb.) Buch.-Ham. ex C.B. Clarke.	Gentianaceae	Bitter tonic, febrifuge, asthma, liver diseases, internal haemorrhage of stomach [34]	Himalayan region
Symplocos laurina (Retz.) Wall. ex G. Don.	Symplocaceae	Bark in haemorrhage, diarrhoea, Gonorrhoea, eye diseases [34]	India to Malesia, China
Symplocos racemosa Roxb.	Symplocaceae	Bark in diarrhoea, liver complaints, dropsy, uterine disorder, ophthalmia, gum bleeding [34]	China, south Asia
Syzygium cerasoides (Roxb.) Raizada.	Myrtaceae	Bark in dysentery, bronchitis; fruit in rheumatism, joint pain [34]	China, Indian to Malaysia, Australia
Syzygium cumini (L.) Skeels.	Myrtaceae	Bark in sore throat, bronchitis, asthma, dysentery, ulcer [33]	Indian Subcontinent, China, Queensland
Tabebuia impetiginosa (Mart. ex DC.) Mattos.	Bignoniaceae	Inner bark antioxidant [137]	South America
Tacca integrifolia Ker Gawl.	Dioscoreaceae	Tubers in haemorrhagic diathesis, cachexia, Leprosy [34]	Tropical and subtropical central Asia
Tagetes erecta L.	Asteraceae	Rheumatism, cold, bronchitis, renal troubles, boils, carbuncles, eye troubles [34]	Mexico
Tagetes minuta L.	Asteraceae	Wound healing, antiseptic, disinfectant [114]	South America
Tagetes patula L.	Asteraceae	Oil antiseptic, juice applied to cuts and wounds [34]	Mexico and Guatemala
Tamarindus indica L.	Fabaceae	Stored fruit pulp in liver ailments [93]; Leaf and stem bark antimicrobial [138]	Tropical and subtropical zones
Tamarix troupii Hole.	Tamaricaceae	Diarrhea, dysentery, foul and sloughing ulcers, sore throat, piles [34]	Afghanistan to Myanmar, Sri Lanka
Tarenna asiatica (L.) Kuntze ex K.Schum.	Rubiaceae	Wound healing [139]	Indian subcontinent
Tanacetum vulgare L.	Asteraceae	Oil in rheumatism, bruises, chronic ulcers; leaf tonic, in hepatic troubles [34]	Temperate Europe and Asia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Taverniera cuneifolia (Roth) Arnott.	Papilionaceae	Leaf on sloughing wounds [34]	Pakistan, India
Taxodium distichum (L.) Rich.	Cupressaceae	Resin of cones diuretic, vulnerary [34]	USA
Taxodium mucronatum Ten.	Cupressaceae	Diarrhea, bronchial troubles; resin on wounds and ulcers [34]	Mexico, United States
Tectona grandis L.f.	Lamiaceae	Flower in urinary problems, bronchitis; seed diuretic; bark in bronchitis [34]	India, Indonesia, Myanmar, Thailand
Tephrosia purpurea (L.) Pers.	Fabaceae	Diuretic, bronchitis, boils, pimples, bleeding piles; seed oil in eczema [34]; antimicrobial [36]	Pantropical
Tephrosia uniflora Pers.	Fabaceae	Diuretic, bronchitis, boils, Syphilis [34]	Africa
Teramnus labialis (L.f.) Spreng.	Fabaceae	Rheumatism, Tuberculosis, nervous affections, hemoptysis, catarrah, febrifuge [34]	Tropical world
Terminalia arjuna (Roxb.) Wight & Arn.	Combretaceae	Bark styptic, febrifuge; leave in ear ache [34]; bark wound healing [31]	Indian subcontinent
Terminalia bellirica (Gaertn.) Roxb.	Combretaceae	Fruit brain tonic; in piles, dropsy, fever, Leprosy [33]	Southeast Asia
Terminalia catappa L.	Combretaceae	Bark diuretic; in dysentery, leaf in ointment of skin affection [34];bark in Leprosy [42]	Tropical Asia, Africa, Australia
Terminalia chebula Retz.	Combretaceae	Fruit tonic, bark diuretic [34]; fruit in chronic ulcers, wounds, scalds [33]	South Asia
Terminalia pallida Brandis.	Combretaceae	Bark diuretic [34];fruit antimicrobial [140]	Indian subcontinent
Terminalia sericea Burch. ex DC.	Combretaceae	Root sap and bark antiseptic; wounds, Leprosy, snakebites [56,67]	Southern Africa
Tetracera indica (Christm. & Panz.) Merr.	Dilleniaceae	Shoots in pulmonary haemorrhage, gargle in aphthae; leaf and shoot in itches [34]	Myanmar, Thailand, Malaysia, Indonesia
Tetracera scandens (L.) Merr.	Dilleniaceae	Burns and boils [34]	China to Malaysia, Indonesia, Philippines
Tetragonia tetragonioides (Pallas) Kuntze.	Aizoaceae	Pulmonary and intestinal affections, stomach cancer [34]	Far East, parts of Australia, New Zealand
Teucrium scordium L.	Lamiaceae	Stimulant, antiseptic, Phthisis, cough, piles, lupus, actinomycosis [34]	Eurosiberian area
Thecostele alata (Roxb.) C.S.P.Parish & Rchb.f.	Orchidaceae	Pseudobulbs in ulcers [34]	Tropical Asia
Thespesia acutiloba (Baker f.) Exell & Mendonca.	Malvaceae	Bark in skin ailments [67]	Some African countries
Thespesia populnea (L.) Sol. ex Corrêa.	Malvaceae	Cutaneous affections, dysentery, haemorrhoids [34]	Pantropical distribution
Thevetia nerifolia Juss.	Apocynaceae	Bark febrifuge, root in tumors, seed in rheumatism, dropsy [34]; leaf, bark antibacterial [36]	Mexico and Central America
Thymus serpyllum L.	Lamiaceae	Essential oil antimicrobial [141]	Europe and north Africa
Thymus vulgaris L.	Lamiaceae	Oil antiseptic; in gargles, whooping cough, bronchitis [34]; leaf and flower antimicrobial [41]	Southern Europe

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Tinospora cordifolia (Thunb.) Miers.	Menispermaceae	Tonic, febrifuge, analgesic, urinary diseases, jaundice, rheumatism, Leprosy [34]; immunostimulant [57, 60]	Tropical India, Myanmar, Sri Lanka
Tinospora crispa (L.) Hook.f. & Thomson.	Menispermaceae	Tonic, febrifuge, analgesic, urinary diseases, jaundice, rheumatism, Leprosy [34]	China, India to Malaysia
Tinospora sinensis (Lour.) Merr.	Menispermaceae	Tonic, febrifuge, analgesic, urinary diseases, jaundice, rheumatism, Leprosy [34]	India, China
Tithonia diversifolia (Hemsl.) A.Gray.	Asteraceae	Flower heads in wounds and bruises [34]	Mexico and Central America
Toddalia asiatica (L.) Lam.	Rutaceae	Root bark tonic, antipyretic, antimalarial, diarrhoea, pain of bowel [34]	Africa and Asia
Torenia polygonoides Benth.	Linderniaceae	Sores, ulcers and dropsy [34]	Indonesia to Malaysia, Oceania
Torenia travancorica Gamble.	Linderniaceae	Leaf in Gonorrhoea [34]	Peninsular India, Sri Lanka
Tovara virginiana (L.) Raf.	Polygonaceae	Tonic, diuretic, vulnerary [34]	Eastern North America
Trachylobium verrucosum (Gaertn.) Oliv.	Fabaceae	Resin diuretic; in ointment for wounds [34]	Tropical East Africa
Trachyspermum ammi (L) Sprague.	Apiaceae	Fruit tonic; in bronchitis, cholera, sore throat; root diuretic, febrifuge, stomach disorder; oil antiseptic, respiratory ailments [34]; seed in wound healing [59]	India
Tribulus alatus Delile.	Zygophyllaceae	Diuretic, tonic, genito - urinary disorders, used to ensure fecundity of women [34]	Worldwide
Tribulus terrestris L.	Zygophyllaceae	Fruit tonic, diuretic, painful micturition, calculous affections [34]; in Leprosy [52]	Worldwide
Trichilia emetica Vahl.	Meliaceae	Leaf and fruit in bruises, eczema and wounds [107]	Tropical and south Africa
Tricholepis glaberrima DC.	Asteraceae	Antiseptic, skin troubles, nervine tonic, urinary troubles, cough, seminal debility [34]	India
Trichosanthes bracteata (Lam.) Voigt.	Cucurbitaceae	Fruit in sores, root in carbuncles and lung inflammation of animals [34]	India to Malaysia
Trichosanthes cordata Wall.	Cucurbitaceae	Root tonic, in enlargement of liver, spleen; visceral organ disorder, Leprosy [34]	India to Malaysia
Trichosanthes cucumerina L.	Cucurbitaceae	Root in bronchitis, leaf in baldness, to assist liver, seed febrifuge [34]	South and Southeast Asia
Tridax procumbens L.	Asteraceae	Leaf in bronchial catarrah, dysentery, diarrhoea, haemorrhage [34];wound healing [142]	Tropical Americas
Trifolium pretense L.	Fabaceae	Flower in corns, cancerous ulcers; herb in sore eyes, burn [34];potential antioxidant [143]	Europe, west Asia
Trigonella foenum-graecum L.	Fabaceae	Seed tonic, intestinal inflammation, boils and ulcers [34]	Worldwide
Triumfetta rhomboidea Jacq.	Malvaceae	Root in dysentery, intestinal ulcers, quickening delivery; leaf and flower in Leprosy [34]	Tropical regions of world
Tropaeolum majus L.	Tropaeolaceae	Infection of urinary and respiratory organs, sores, itches [34]	Andes from Bolivia north to Colombia
Tropaeolum minus L.	Tropaeolaceae	Infection of urinary and respiratory organs, sores, itches [34]	South America

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Turbina oblongata (E.Mey. ex Choisy) A.Meeuse.	Convolvulaceae	Leaf in sores and abscesses [67]	African countries
Turraea villosa Benn.	Meliaceae	Roots in fistula and Leprosy [34]	India to Malayasia
Tussilago farfara L.	Asteraceae	Styptic; leave diuretic, in cough, cold, asthma, rheumatism; flower in eye troubles [34]	Europe, parts of western and central Asia
Tylophora fasciculata Thwaite.	Asclepiadaceae	Leaf on ulcers and wounds; root febrifuge [34]	India, Sri Lanka
Tylophora indica (Burm. f.) Merr.	Apocynaceae	Root stimulant; in asthma, bronchitis, whooping cough, dysentery, diarrhoea, gouty pains [34]	India to Malaysia
Typha elephantina Roxb.	Typhaceae	Rhizome diuretic, in dysentery, measles [34];in Leprosy, wounds [52]	North Africa, west and south east Asia
Uraria crinita (L.) Desv. ex DC.	Fabaceae	Diarrhoea, dysentery, enlargement of liver, spleen, pustules, tumors, fistula [34]	China, India to Malaysia, Australia
Uraria picta (Jacq.) Desv. ex DC.	Fabaceae	Root in cough, fever; root and pod in anal prolapse of children, pod in sore mouth [34]	Africa, south and southeast Asia, Australia
Urena lobate L.	Malvaceae	Flower expectorant; in aphthae, sore throat [34]	Tropics of both hemispheres
Urena sinuata L.	Malvaceae	Leaf in inflammation of intestine and bladder, flower in bronchitis [34]	Tropical and subtropical areas
Urginea indica (Roxb.) Kunth.	Asparagaceae	Bulbs stimulant, expectorant, diuretic, dropsy, rheumatism, skin troubles, warts, corns [34]	South Asia to south Africa
Urginea maritima (L.) Baker.	Asparagaceae	Expectorant, in dermatitis [69]	Parts of Europe, Asia and America
Urtica dioica L.	Urticaceae	Uterine haemorrhage, epistaxis, rheumatism, hepatitis, cholangitis, diuretic, diarrhoea [34]	Part of Europe, Asia, Africa, America
Urtica pilulifera L.	Urticaceae	Leaf antimicrobial [40]	Europe
Usnea intermedia (A. Massal.) Jatta.	Parmeliaceae	Aerial part antimicrobial [144]	North America
Usnea filipendula Stirt.	Parmeliaceae	Aerial part antimicrobial [144]	North America
Usnea fulvoreagens (Rasanen) Rasanen.	Parmeliaceae	Aerial part antimicrobial [144]	North America
Usnea longissimi Ach.	Parmeliaceae	Expectorant and in ulcers in China [34]	Coastal Europe, Asia, North America
Usnea sikkimensis Biswas.	Parmeliaceae	Lung troubles, haemorrhages, asthma [34]	Sikkim, India
Utricularia caerulea L.	Lentibulariaceae	Dressing of wounds [34]	Tropical Africa, Asia, Australia
Uvaria narum Wall.	Annonaceae	Root bark in rheumatism, bowel complaints, eczema; leaf in jaundice, fever [34]	South India, Sri Lanka
Vaccinium oxycoccos L.	Ericaceae	Fruit antimicrobial [146]	Cool temperate northern hemisphere
Vaccinium macrocarpon Aiton.	Ericaceae	Fruit antimicrobial [146]	North America
Vallaris solanacea (Roth) Kuntze.	Apocynaceae	Latex on wounds and sores [34]	India, Myanmar, Sri Lanka
Vanda parviflora Lindl.	Orchidaceae	Leaves on cuts, wounds, ear ache [34]	India, Myanmar, Sri Lanka
Vanda tessellata (Roxb.) Hook. ex G.Don.	Orchidaceae	Leaf juice in otitis, root bronchitis, rheumatism, fever [34]	Indian subcontinent to Indochina

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Vateria indica L.	Dipterocarpaceae	Resin tonic; in bronchitis, throat troubles, piles, diarrhoea, rheumatism, Tuberculosis, boils [34]	India
Vepris bilocularis (Wight & Arn.) Engl.	Rutaceae	Wood oil in rheumatism, asthma, Leprosy; root in liver problems [34]	Southern Western Ghats, India
Verbascum coromandelianum (Vahl.) Kuntze.	Scrophulariaceae	Febrifuge, in skin eruption; leaf in diarrhoea, dysentery [34]	Afghanistan to Thailand
Verbascum sinaiticum Benth.	Scrophulariaceae	Leaf in fungal infections and wounds [44, 129]	Northern Africa, Iran to Afghanistan
Verbascum thapsus L.	Scrophulariaceae	Leaf and fruit in diarrhoea, pulmonary diseases of animals; root febrifuge, oil in frost bite, piles, ring worm in Europe [34]; Antimicrobial [147]	Europe, Africa, Asia, Americas, Australia
Verbena officinalis L.	Verbenaceae	Liver complains, eczema, cold, fever, bronchitis; leaf in rheumatism, wounds [34]	Europe
Vernonia adoensis Sch. Bip. ex Walp.	Asteraceae	Flower in cabies and other skin diseases [67]	Some African countries
Vernonia cinerea (L.) Less.	Asteraceae	Root in diarrhea, stomach ache, cough, colic; flower in fever, rheumatism, conjunctivitis; seed in cough, colic, leucoderma, psoriasis and other skin diseases [34]	Pantropic
Vernonia schimperii DC.	Asteraceae	Leaf antimicrobial [39]	Ethiopia,Yemen, Saudi Arabia
Vernonia teres Wall.	Compositae	Ulcers, wounds, dropsy, dysmenorrhoea [34]	Tropical Himalayas, India
Veronica beccabunga L.	Plantaginaceae	Diuretic, urinary troubles, scurvy, scrofulous and other skin affections [34]	Europe, Africa, north and western Asia
Viburnum colebrookianum Wall. ex DC.	Caprifoliaceae	Leaf on old sores [34]	Eastern Himalayan region
Venidium arctotoides (L.f.) Less.	Asteraceae	Leaf in wounds [58]	South Africa
Vigna unguiculate (L.) Walp.	Fabaceae	Seed, root and leaf in wound healing [72]	Semi-arid regions
Vinca minor L.	Apocynaceae	Leaf in diarrhoea, dysentery, Tuberculosis [34]	Central and southern Europe
Viola patrinii DC.	Violaceae	Ulcers, foul sores, Syphilis; in cancer in Chinese medicine; flower in coughs and colds [34]	Japan, Korea, Mongolia, Russia
Viola tricolor L.	Violaceae	Stimulant, diuretic, diseases of blood, skin, rheumatism, expectorant, asthma [34]	Hymalayan regions, Europe, North America
Viscum articulatum Burm. f.	Santalaceae	Febrifuge, paste on cuts [34]	India to Malaysia
Viscum capense L.f.	Santalaceae	Warts and other skin complaints [67]	South Africa
Vitex altissima L.f.	Lamiaceae	Stem bark in wound [38]	India to Malaysia
Vitex lucens Kirk.	Lamiaceae	Leaf in sprains, ulcers, sore throat [34]	New Zealand
Vitex negundo L.	Lamiaceae	Root tonic, febrifuge, diuretic, in rheumatism, dysentery, piles; flowers in diarrhoea, fever, liver complaints [34]; in skin diseases [57]	South and Southeast Asia
Vitex peduncularis Wall. *ex* Schauer.	Lamiaceae	Leaf and bark in Malaria and black water fever; leave antibacterial [34]	India to Malaysia
Vitex pinnata L.	Lamiaceae	Leaf on wounds [34]	South and Southeast Asia
Vitex trifolia L.	Lamiaceae	Leaf in Tuberculosis, leaf and root febrifuge [34]	Coastlines of tropical east Africa

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Vitis vinifera L.	Vitaceae	Sap in skin affections [34]	Mediterranean region, southwestern Asia
Voacanga foetida (Blume) Rolfe.	Apocynaceae	Latex in fistulae, tumors, pustules, stomach and intestinal troubles [34]	Indonesia, Malaysia, Philippines
Wagatea spicata (Dalzell) Wight.	Fabaceae	Root in pneumonia, bark in skin troubles [34]	India
Wahlenbergia marginata (Thunb.) A. DC.	Campanulaceae	Herb in skin troubles, root in pulmonary infections [34]	Asia, Australia, New Zealand
Waltheria indica L.	Malvaceae	Root in internal haemorrhages, thrush [34];used in wounds [45]	Central and South America
Warburgia salutaris (Bertol.f.) Chiov.	Canellacea	Bark in skin complaints [67]	Southern Africa
Wedelia biflora (L.) DC.	Asteraceae	Leaf diuretic, on cuts, ulcers, sores, varicose veins [34]	Tropical belt of the Indo-Pacific region
Wedelia chinensis (Osbeck) Merr.	Compositae	Aerial part in skin diseases [57]	South east Asian countries
Wedelia wallichii Less.	Asteraceae	Herb poultice on wounds [34]	India
Withania somnifera (L.) Dunal.	Solanaceae	Root in cough, rheumatism, female disorders, ulcers; leaf febrifuge; in lesions, sore eyes [34]; immunostimulant [60]; antiseptic, in wound healing [33]	India, Nepal, China,Yemen
Woodfordia fruticosa (L.) Kurz.	Lythraceae	Flower, leaf and fruit gum antimicrobial [36]	India
Xanthium spinosum L.	Asteraceae	In Hydrophobia and intermittent fevers [34]	Worldwide distribution
Xanthium strumarium L.	Asteraceae	Chronic Malaria, leucorrhoea, urinary diseases; leaf diuretic, anti syphilitic, in herpes; root tonic, in cancer, ulcers, boils, abscesses [34]	North America
Ximenia caffra Sond.	Olacaceae	Root in wound difficult to heal, septic sores [45, 107]	Eastern and southern Africa
Ximenia Americana L.	Olacaceae	Root febrifuge; in veneral diseases, jaundice, diarrhea, bark in sores [34]	Pantropical
Xylia xylocarpa Roxb. Taub.	Fabaceae	Bark in Gonorrhea and diarrhea [34]	South and Southeast Asia
Xyris complanata R.Br.	Xyridaceae	Herb antiseptic, in itches, ring worm, Leprosy [34]	China, India to Malaysia, Australia
Xyris indica L.	Xyridaceae	Itch, ringworm, Leprosy [34]	India to Malaysia
Xysmalobium undulatum (L.) W.T. Aiton.	Apocynaceae	Root in sores, wounds and abscesses [56, 67]	Africa
Yucca gloriosa L.	Asparagaceae	Rheumatism, sores, ulcers, dysentery, Phthisis, bronchitis, Haemorrhagic septicaemia [34]	Southeastern United States
Zanonia indica L.	Cucurbitaceae	Fruit antiseptic, in cough, asthma [34]	South and Southeast Asia
Zantedeschia aethiopica (L.) Spreng.	Araceae	Leaf in wounds, boils, sores [55,56]	Southern Africa
Zanthoxylum capense (Thunb.) Harv.	Rutaceae	Leaf in sores [67]	Eastern regions of southern Africa
Zanthoxylum armatum DC.	Rutaceae	Fruit oil antiseptic, used in dental preparations [34]	China, India to Malaysia

(Table 1) contd….

Plant	Family	Plant Parts Used as/in	Native Habitat/Distribution
Zanthoxylum limonella (Dennst.) Alston.	Rutaceae	Fruit in asthma, bronchitis, rheumatism, tooth ache; oil antiseptic; in Cholera, dermatosis [34]	India to Malaysia
Zingiber officinale Roscoe.	Zingiberaceae	Rhizome antioxidant, stimulant [34]; common cold, anticholesterol [60]	Indian subcontinent
Zingiber zerumbet (L.) Roscoe ex Sm.	Zingiberaceae	Rhizome in cough, asthma, Leprosy, skin diseases [34]	India
Ziziphus mucronata Willd.	Rhamnaceae	Leaf, root and bark in boils, sores, swellings [56, 67]	Southern Africa
Ziziphus mauritiana Lam.	Rhamnaceae	Fruit antimicrobial [148]	Paleotropic

It is observed during screening that more than one part of a medicinal plant is used in more than one medicinal purpose in many cases. As the present work is related to enlisting of medicinal plants reported to have activities related with any direct or assisting action in controlling of infective diseases, other uses of the plants and plant parts are omitted. Though many parts of the reported plants are used for many medicinal purposes and forms of use are also many (decoction, juice, oils, watery extract, direct cut pieces of plant parts *etc.*), only related reported uses are included and procedures of preparation, doses etc. are omitted as these are not available for many plants in the source articles.

The listed plants may have some important activities as per their reported use, like

i) Direct anti bacterial, anti viral, anti fungal actions *etc.*

ii) Overall immunostimulant and/or antioxidative actions,

iii) Power to protect and/or restore functions of a body system,

iv) Stimulation of fighting efficacy of a body system during disease,

v) Efficacy to bring symptomatic relief/ reduction of severity of any devastating disease *etc.*

As the reported uses of the medicinal plant parts are broad and multifunctional, some other means of treatment of some other non- infective diseases may also be identified and developed as an outcome of an elaborated research on them.

7. A COMPREHENSIVE RESEARCH PROPOSAL

In addition to the contemporary pattern of research performed for validation of traditional claims and searching of effective antimicrobial active principles for use as medicine, the study of the plant parts having reported use for actions hampering the establishment of any disease of infective origin inside the body system and their spread anyway may also be started. As most of the medicinal plants of the list are reported to have uses in more than one purpose and many plants are used for almost same type of purposes, a detailed correlated study may be beneficial.

7.1. Proposed Steps to Study on the Listed Plants

1. Arrangement of total study facilities near the resources:

It can be performed either by establishing laboratory and other related facilities i) near the native place of the study plant/s with assurance of supply of sufficient materials at succulent stage within a very stipulated time, or ii) after making arrangement for cultivation of the plant/s near the laboratory facilities in an environment (soil, climate *etc.*) almost natural to it's native place. Seasonal availability of study plant/s or plant parts has to be considered during planning. It is required due to the reason that soil and climate may have an effect on the phytochemicals of a plant. The developmental stage of the plants may have some relationship with their use for medicinal purposes in many cases. Only the cultivated plants may be used for study purpose and the naturally growing plants may be left to keep the ecological balance intact. Use of pesticides and inorganic manures may be avoided.

2. Greenhouse may be arranged in the areas of cooler climate for cultivation of the plants of torrid zones. Proper shed with air cooling or conditioning facilities may be arranged for the reverse requirement.

3. The plant materials may be collected for study in the already standardized laboratories. Planning for study of all the different available parts of the study plants at the succulent stage as well as the solvent extracted condition of dry parts may be performed, without considering the report of the use of a particular part in traditional claims.

4. The freshly collected succulent materials may be processed further for:

i) Study of the effect of storage on efficacy of plant parts/materials maintained at different freezing conditions (of different level of freezing temperatures).

ii) Study of efficacy of the succulent stem, root, leaf *etc.* as well as their juices, decoction *etc.* directly *in vitro* and *in vivo* as per logical decision for all the related effects (direct antimicrobial, immunostimulant, antioxidant, local effects *etc.*).

iii) Air drying/shade drying of the plants as per standard methods.

iv) Extraction of plant materials from the dry plant parts by using different solvents as per standard methods.

v) Study of efficacy of solvent extracted plant materials by *in vitro* studies or by other study models as per logical decision.

vi) Study for identification of phytochemicals by Purification and Structure Elucidation may be performed following standard methods.

vii) Biochemical, Pharmacological and Toxicological characterization of all the succulent plant parts, dry plant part extracts as well as the identified active principles may be arranged after logical modification of the existing procedures of toxicity study, *in vivo* study and clinical trials.

viii) Study on combinational use of more than single active principle of the same plant or other plants with logical selection may be performed.

ix) Study of the use of succulent plant parts of more than one plant or their juices or dry plant parts in different logical combinations may be performed.

For searching of direct antimicrobial effects, antimicrobial study of all the materials (juices collected from different succulent plant parts of the study plants by pressure, decoctions and other type of reported use, different solvent extracts, aqueous extracts *etc.* of dry plant parts as well as the active principles) may be performed primarily. It can be performed on many microorganisms, but some model microorganisms may be selected for that purpose. Bacteria like *Escheria coli* may be one of them for their common presence and availability. Then the further study of the plant parts with positive results may be tested against resistant bacterial strains. Study of immunomodulation, antioxidant and such other protective effects may be performed following standard methods with logical modifications, if required.

As information about phytochemicals (active principles) of many plants are already known, those can be listed after verification. The study reports may be matched with the study report of at least other two laboratories working in the same manner.

A complete database may be prepared for each reported medicinal plant/claim.

This database may lead towards efficacious use of plant-derived medicines for the intended purposes.

8. THE HORIZON OF A NEW TYPE OF PHYTOMEDICINE BASED TREATMENT OF INFECTIVE DISEASES AND ESTABLISHMENT OF EXPORT-ORIENTED INDUSTRIES

During the last few decades, a huge amount of fund was regularly invested in continuous searching of new antibiotics. But during the last few years, it is found that the newly developed antibiotics are becoming ineffective very soon due to the rapid spread of different antibiotic resistance plasmid bound genetic materials among microorganisms. Even the antibiotics kept as stock for emergency use are also found ineffective in many cases. Many bacteria are already resistant to those antibiotics without facing them anytime. The investors are also losing interest to invest in new antibiotic development for not getting expected profit. So, continuous development of new antimicrobial agents may not solve the present trend of losing of the efficacy of antibiotics. The plant-derived antimicrobial agents may work through different pathways than commonly used antibiotics and chemotherapeutic agents and thus may be an additional or alternative way to combat the problem [20]. Same type of effects may be identified among many plant-derived medicines against the bacterial biofilms also.

The countries having huge resources of natural plants are definitely having huge resources of medicinally active plants. The validated succulent plant part extracts of those medicinal plants having antimicrobial actions, direct or indirect, may be utilized for creation of many export-oriented agro-medicine industries. After proper study, succulent plant part extracts, cut pieces, dry powders, green parts, latex *etc.* having desired efficacy (at local or systemic uses) may be exported with proper packaging for herb-based treatment throughout the globe as an effective alternative of modern medicine. Some low-cost techniques like dosing of such medicine in small aliquots, storing at some low temperatures (0 $^{\circ}$C, - 10 $^{\circ}$C, - 20 $^{\circ}$C *etc.*) or freeze drying as per requirement and research reports are to be employed for that purpose [13].

As the biological materials are vulnerable to easy decomposition, maintenance of sterility and proper temperature during packaging and transport (cold chain) may play a very crucial role. The qualities of such bio-medicine require checking before use by the patients. Different indicator chemicals available for use

on the vials or packets, such as Vaccine Vial Monitors used during transport of thermolabile vaccines may be used for that purpose also.

So, a new journey can be started with new tools of treatment of infectious diseases by some alternatives of antibiotics along with the creation of many cheap, export-oriented, labour involving industries.

CONCLUSION

The present system of continuous development of new antimicrobial substances, mainly antibiotics, to cure the diseases caused by microorganisms may not work in near future. Herbal substances, both unaltered natural and isolated principles, can work against the invasion of microorganisms inside the body system possibly with some different mechanism of actions than the presently used antibiotics. So, it can be expected that it will not be easy for the targeted microorganisms to get accustomed to the activities of such diverse types of molecules to establish any disease. Different extracts of effective medicinal plants may create a new way of herb-based treatment of diseases of infective origin as well as the formation of many herb-based export oriented agro-medicine industries.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The author declares no conflict of interest, financial or otherwise.

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